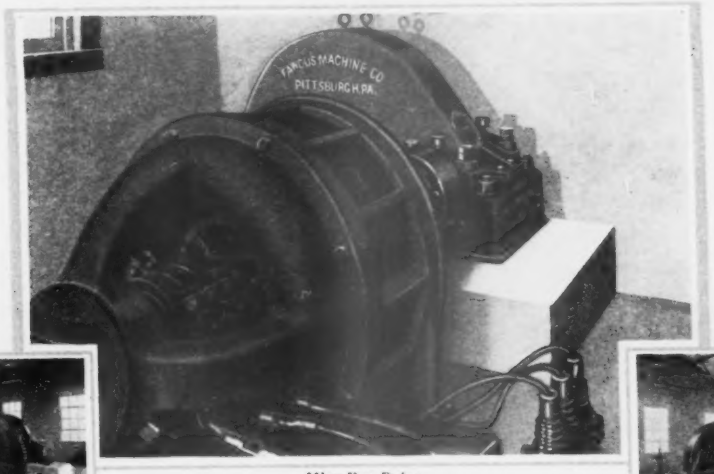
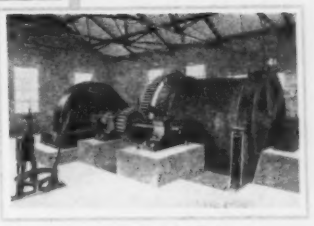
The MINING CONGRESS JOURNAL

Volume 11 FEBRUARY, 1925 *No.* 2



Mine Fan Drive

Fawcus Hoist Drive



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"No, Thank You, Mr. Chairman, I Don't Believe We Need A New Power Plant, Nor An Addition To Our Present Plant"

THUS spoke the General Superintendent to the Board of Directors. The Chairman looked surprised—

"What! You don't need more capacity? I thought from your pleadings and arguments at our last meeting that we would have to stop running coal if you didn't get some help.

"Yes—I know that you must have thought that for I honestly felt the same way. But since our meeting last month I have spent some time studying the question, for I knew that we couldn't afford to spend much money just now.

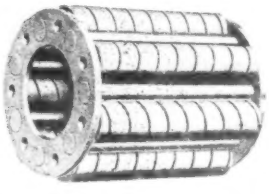
"As a consequence of my investigations I am now pretty firmly convinced that if we will equip all our old cars which have plain bearing trucks with Hyatt equipped trucks, we will require so much less power that we can postpone the purchase of additional power equipment for several years until we get more cars to take care of additional workings.

"From the operators I talked with I heard nothing but praise of Hyatt bearings and of the manufacturers who furnish their cars and trucks equipped with Hyatt bearings. The test reports of the Hyatt Company helped me wonderfully, but the thing which really sold me was what the fellows who use them had to say.

"The cost will be much less, and we can get the trucks quickly, in fact we can just about buy them without borrowing money. Whereas we would have to finance the purchase of the power plant and it would be months before we could get the use of the power, and in the meantime our present plant would be seriously overworked. The purchase of the Hyatt equipped trucks will prove to be a real investment."

The moral of the above story is obvious. Possibly you do not need additional power house facilities to haul your hard running plain bearing mine cars—but you may feel that you need more or larger locomotives. The same reasoning will apply.

If you want to conserve power and at the same time get better all-around service from your cars, let us hear from you. Complete engineering and sales information will be furnished without obligation.



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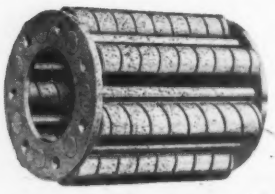

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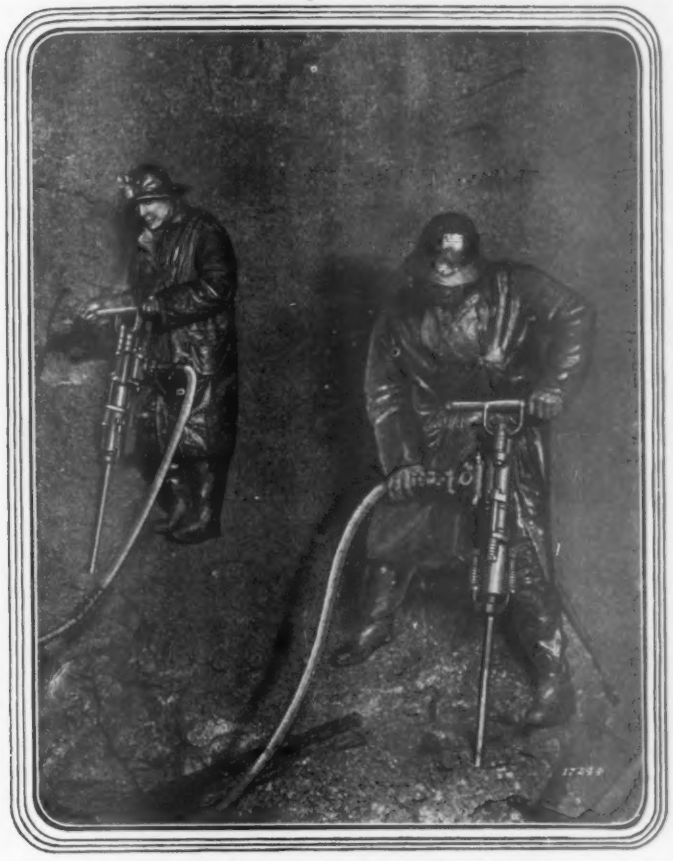

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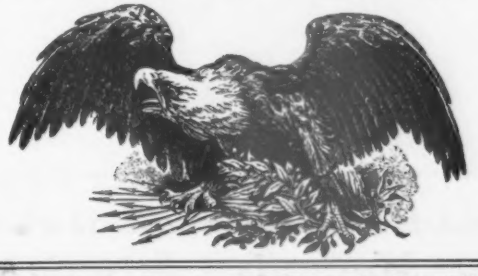
Editor

MCKINLEY W. KRIEGH
Assistant Editor

HERBERT WILSON SMITH
Associate Editor



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Legislative Editor

F. E. PRIOR
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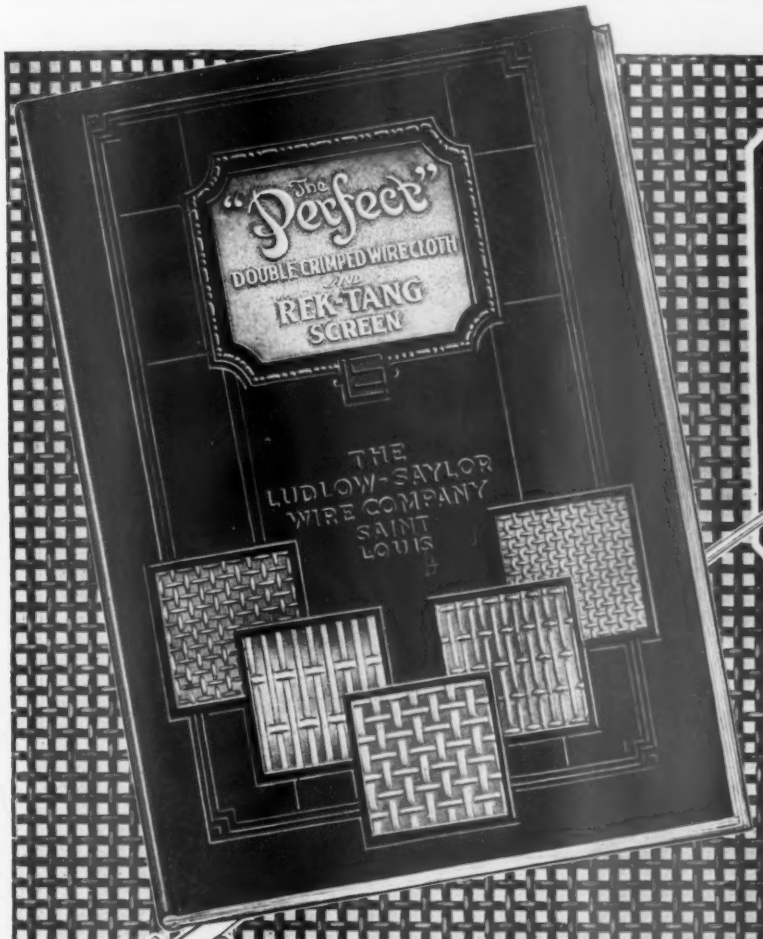

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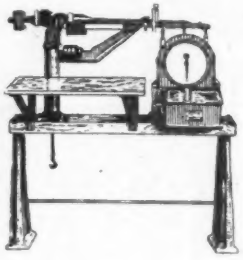

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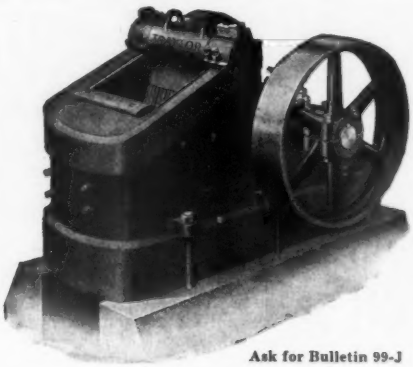

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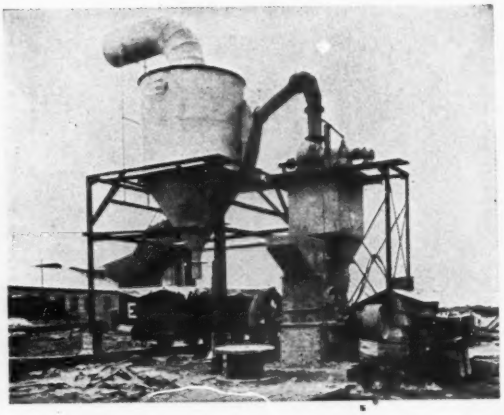

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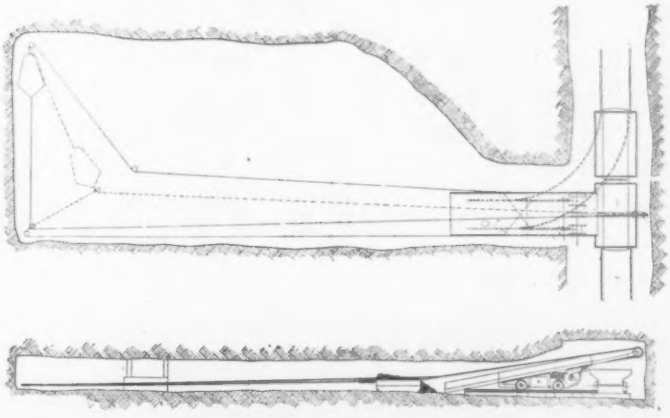

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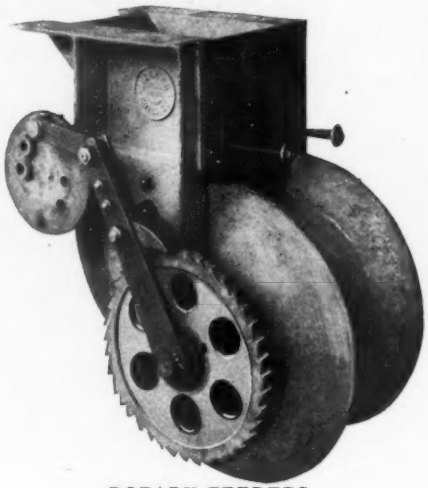

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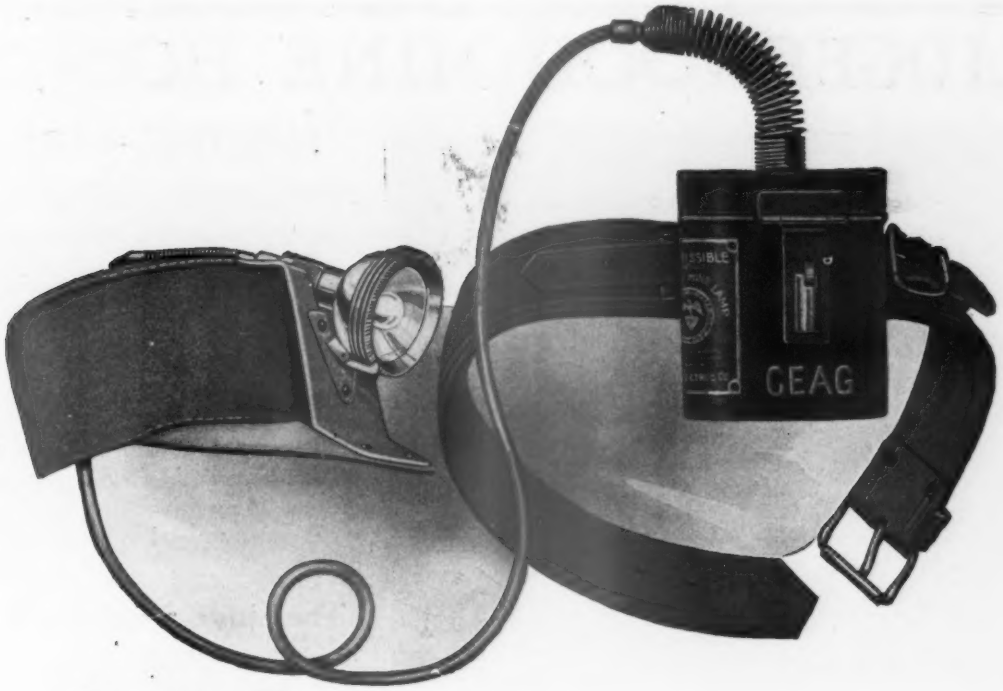
The Washington office is conducted for the benefit of members of the American Mining Congress. Among other things, it furnishes data on every phase of Federal and State taxation, and furnishes taxpayers and their counsel, when coming to Washington, with every facility for expediting contacts with the proper government officials.

For Information Address

Tax Division, The American Mining Congress

841 Munsey Building, Washington, D. C.



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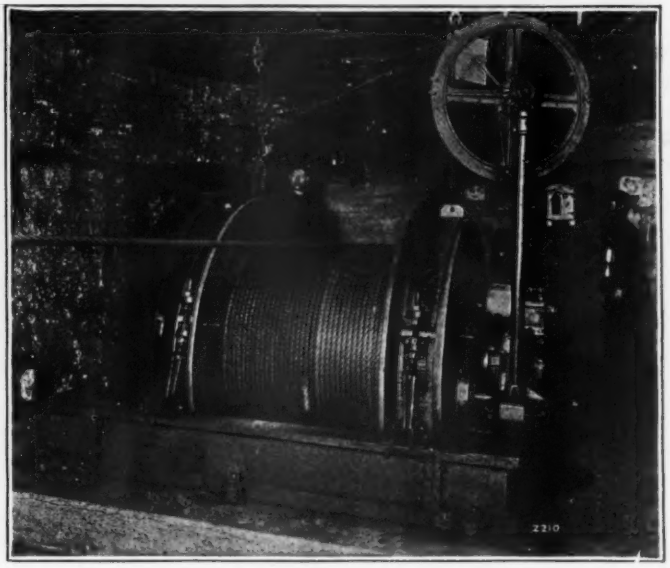

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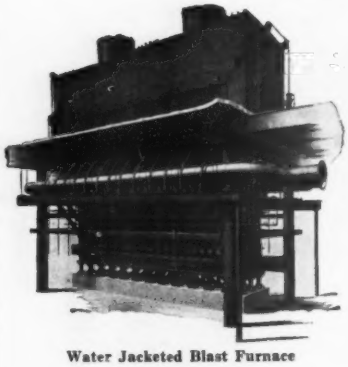

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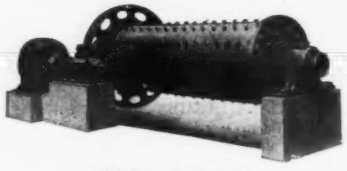

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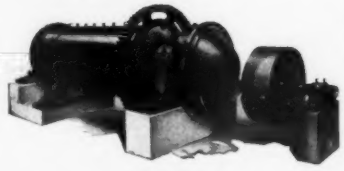

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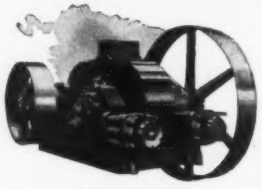

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THE EXPLOSIVES ENGINEER announces a national competition under the auspices of the United States Bureau of Mines, to promote safety in mining and quarrying.

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One bronze cast of this will be awarded for a year to the coal mine having the lowest accident rate during 1925; another will go to the metal mine with the best record, and a third to the winning quarry or open-pit mine. In each instance the holder of the trophy may have a replica made, and erected permanently on the mine or quarry grounds. Every employe of the winning mines or quarry will receive a certificate of honor.

The award will be made each year by a jury governed by rules prepared in conjunction with the Bureau of Mines. Enter this contest now by notifying the Bureau, and make use of the plan in stimulating your force to reduce accidents.

The January number of THE EXPLOSIVES ENGINEER contains a detailed description of the plan and large pictures of all four sides of the trophy, showing the three panels (one devoted each to metal mining, coal mining, quarrying and open-pit mining), which are not illustrated here. For a free copy, write your name, address, company, and position in the margin below, and mail it to—

THE EXPLOSIVES ENGINEER

WILMINGTON DELAWARE

Gentlemen: Please send me a copy of the January number. (Sign below.)

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The MINING CONGRESS JOURNAL

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KEEPING FAITH

THE Pittman Act provides "that the allocation of any silver to the Director of the Mint shall, for the purpose of this act, be regarded as a sale or resale."

It is a fundamental principle of law that a sale is an irrevocable transaction. On September 7, 1918, the Assistant Secretary of the Treasury allocated 1,000,000 standard silver dollars to the Director of the Mint and directed the repurchase of an equal amount of silver therein contained, from American production, at $1.00 an ounce. On November 28, 1919, the Assistant Secretary of the Treasury allocated 10,000,000 silver dollars to the Director of the Mint for the purpose of subsidiary coinage and again directed repurchase under the terms of the Pittman Act. On November 6, 1920, 111,168 silver dollars were similarly allocated. On November 18, 1920, 3,000,000 ounces of silver, and December 18, 1920, a second 3,000,000 ounces of silver were so allocated and repurchases directed under the terms of the Pittman Act.

The Assistant Secretary of the Treasury in so acting was exercising his best judgment in relation to the condition then existing. According to the testimony of the Treasury officials, the silver then on hand for purposes of subsidiary coinage was not available for such use, either due to its position or its condition. Either it was not located at the mint in which it was to be coined or it was in the form of matte or other unmelted or unrefined silver, which made it unvailable for use. The market price of silver at this time was many points above $1.00 an ounce. The Assistant Secretary of the Treasury, therefore, had the choice of three courses of action. He must either prepare the silver which he had in various forms into form for coinage; he must purchase silver in the open market at several points above $1.00 an ounce, or he must make use of silver dollars under the terms of the Pittman Act. Obviously, the last course was the wisest. This was the course he chose and the transaction so stood on the books of the Treasury Department until February 11, 1922, more than a year thereafter.

At that time the price of silver in the open market had decreased to the point where it was below $1.00 an ounce. The then Assistant Secretary of the Treasury thereupon assumed authority to revoke the transaction which had been advantageous at the time and which had been in accordance with the terms of the Pittman Act, and ordered the books of the Treasury Department revised to show this as a loan, in order to avoid the purchase of silver at $1.00 an ounce as had been ordered to be done. This turns back to the principle of law, which is that a sale is an irrevocable transaction and the terms of the Pittman Act provide that an allocation to the Director of the Mint shall, for the purposes of this Act, be regarded as a sale or resale.

It should never have been necessary to introduce the bill directing the Secretary of the Treasury to complete purchases of silver under the Act of April 25, 1918. These purchases should have been completed under the terms of the Act without this supplementary legislation. In the light of the record of these transactions it is apparent that had they been under the authority of a private individual or in the normal conduct of private business that those responsible for them would have been chargeable with bad faith. It is to be noted that the allocations and orders for repurchase were under one administration and the attempted revocation under a succeeding one. The Supreme Court has vigorously decided in unmistakable language that the attempted revocation by a succeeding cabinet officer of the consummated act of his predecessor is ultra vires.

A DEPLORABLE SITUATION

THE weakening of the morale of the employes of the Income Tax Unit of the Bureau of Internal Revenue under the whip of an investigation is a matter in which the tax-paying public should be vitally interested. The existence of a state of affairs which impels a feeling of reluctance on the part of these employes to decide any question involving any considerable sum of money against the Government, however indefensible such a decision may be, is to be deplored. That such a state of affairs exists is evidenced by the character of the final determinations of tax liability that are being sent out from the unit on which taxpayers are compelled to enter protests and take appeals.

The Senate's investigation of the bureau is still in full swing. Additional agents have been employed by the investigating committee to examine in broader detail the records and files of the Income Tax Unit. Announcement was made some time ago that no fraud or corruption had been disclosed, but that the investigation would be continued for the purpose of ascertaining whether or not there exists gross inefficiency and lax administration in the methods, policies and practices of the unit. And it is said that the committee hopes to develop recommendations for the improvement of the administrative system.

The Tax Simplification Board, created under the 1921 revenue law, performed the latter function. That board's recommendations were being adopted and carried into effect as rapidly as was consistent with good management and efficient administration, and excellent results were being obtained, until the investigation intervened in the program. Thus it appears that the present investigation constitutes a duplication of the efforts of the board. If, in addition to this duplication of effort, the committee contemplates the formulation of amendments to the revenue laws, it would seem to be trespassing upon a recognized function of the Finance Com-

mittee of the Senate in violation of the rules of that body.

The public is not concerned particularly with the efforts of someone in the legislative branch of the Government to "get even" with someone in the executive branch, for that is child's play; but when those efforts lead to delays and complications in the settlement of claims, it is time to call a halt on the proceedings. If one individual wants to get revenge on another by throwing dirt and splashing mud all over the other's nice new Sunday clothes, that perhaps may remain a personal matter if the one who tries to throw the dirt and splash the mud is accurate in his aim and does not hit or injure innocent bystanders. But when, in order to get revenge, such an one attempts to throw dirt and splash mud into the well-oiled machinery of his enemy's plant, in this case, the great organization of the Bureau of Internal Revenue, that is a matter of serious public concern.

The fear in some quarters that opposition to the investigation will be presumed to mean that there is something radically wrong with the bureau that ought to be investigated is preposterous. There is no organization in the world, similar to the Income Tax Unit, where there is so little opportunity for graft and corruption. The elaborate system of checking, rechecking, and reviewing each report before it becomes the final determination of the Commissioner furnishes ample protection to the Government and affords opportunity for immediate detection of attempted fraud or conspiracy in the adjustment of tax liability.

Something drastic should be done and done at once, and in this case it is up to the Senate to do it. The only proper thing to be done is to discontinue the investigation and permit the Income Tax Unit to function properly in the adjustment of tax liability and the settlement of claims.

AN UNWARRANTED ASSUMPTION

IN an effort to protect the wages provided for in the Jacksonville agreement, the miners' union has tried to control the nonunion field. A necessary concomitant, it seems, is a renewal of the war upon the nonunion miners of West Virginia. Last month several men were shot down while on their way to work and one was killed instantly, while others have since died.

When two persons disagree over a social or economic question, it is always a question just how far one of them may go in his effort to persuade the other to accept his views. But there is a point where all doubt ceases. That point is where the advocate of one view secretes himself and shoots the other in the back and kills him.

In the West Virginia incident it is not of record that the person who did the shooting had ever talked with the person who was shot down. It is not of record that their minds had ever measured lengths and that the persons who were shot had refused to "listen to reason." There is lacking any record that the persons shot had ever been reasoned with. The whole story seems to be that these men were shot down merely because they were on their ways to work at a certain place. Responsible public officials on the ground have said publicly that the persons who did the shooting were moved by their desire to unionize the coal mine in which the others were employed.

Murder is condemned by the laws of God and of men. It is, of course, the one unanswerable argument. But it is the one universally forbidden argument. Under no circumstance is it a permitted board of arbitration on social or economic questions. Those who resorted to it in West Virginia are outlaws; wholly beyond the pale.

But there is another phase of the question which is equally vital to the welfare of the miners themselves. The statistics, which Dr. H. M. Payne brought to light in his recent economic survey for the American Mining Congress, are complete proof that high wages are justified only when there is the most elaborate use of mechanical power to supplement the manual labor. He shows, for instance, that the wages of workers, around the world, have risen in direct proportion to their use of industrial power. He shows that England pays almost exactly twice the wages paid by Japan and at the same time uses almost exactly twice the developed horsepower per wage earner. He shows that the United States pays almost exactly twice the wages paid by Great Britain and that the United States has almost twice the developed horsepower per wage earner that England has. Thus it seems that the worker can demand higher wages only when he consents to use the developed horsepower.

The miners' union not only demands much higher wages than are paid to other industrial workers in their own vicinity but it also is refusing to use power-driven machines to supplement the work of the manual laborer. It is thus demanding money which it refused to help earn. And it is making the cost of power to the users of coal so high that it is interfering with any wage increases which might come to those other workers.

Having thus committed itself to the most unsound of economic policies, the miners' union might naturally expect to find itself in a losing position. And, being in that position, it does not advance its cause any by allowing its fanatics to shoot down from ambush those who happen to espouse a sounder and better economic policy. Its assumption that violence will so advertise the issue that the people will condone its action and decide in its favor is wholly unwarranted.

THE ODDIE COAL BILL

WITH less than 30 days remaining of the life of the existing Congress, and with all pending measures expiring with that Congress, it is hardly possible that any bills recently introduced can be enacted into law. It is most unlikely, therefore, that Senator Oddie's bill which provides for a department of mines, and under it a bureau of coal economics, has any chance of success. Even so, it is an interesting subject for gossip even if one but confines himself to the origin of its provisions. This is particularly true because the bill seems to have become a sort of convention hall in which has assembled all of the proposals of the last 10 years with respect to federal control of coal.

Its first ambition—necessity is the better word—is to write some phrase into a bill which will allow federal coal regulation to slide past the watchful eye of those who have fixed notions about the Constitution. This is not easy. Coal production is a purely local matter which for years has been elaborately regulated under the police powers of the various states. These states are not going to relinquish their control. Also, the United States Supreme Court, time and again, has said that production is not commerce; therefore, local production cannot be regulated under the interstate commerce powers granted by the Constitution. How, then, is coal to be brought under federal regulation.

In 1923 Governor Pinchot, of Pennsylvania, was struggling with exactly that same question. He thought it very doubtful that the Congress could write a constitutional statute on that subject; therefore, he pro-

posed a commission to be appointed by the various state legislatures and thus collectively to control coal by collective state authority. The theory upon which he proposed to proceed was the same as that of the Supreme Court when it originated commission control of the Colorado River. The Supreme Court in that case said that while each state had a right to use the water of the river, it must do so in such a way as not to interfere with the "customary flow" of that stream. This was an old principle dating back to the days of Blackstone. That old phrase captivated Governor Pinchot. He immediately assumed that if there was a "customary flow" to a stream and if that could be controlled by federal authority, there must be a "customary flow" of coal which also could be controlled. So, by using the term "customary flow," coal, which defied federal regulation on any other theory, could be brought within the purview of the federal Congress. The governors of the states didn't take very kindly to Mr. Pinchot's idea. Certainly the various legislatures failed to appoint any committee or to do anything else in furtherance of the project. Therefore, the Pinchot proposal died when it was quite young.

The ghost of Pinchot's dead infant now comes back to life in the Oddie bill. In that measure the Pinchot language is employed again. It is to be done when this interesting bill says that coal is in interstate commerce, if and when it is in the "customary flow" of coal into interstate commerce. We venture the opinion that the Supreme Court will not easily be misled by such an obvious attempt to phrase an unconstitutional provision in a constitutional way.

The next difficulty which the regulator encountered was to compel the surrender of the desired information about the private affairs of coal operators, coal merchants, and coal users. That is, a bureau chief can write a letter to a man asking him for information from his private books, but the man may refuse to answer. It then becomes necessary to compel that man to answer. If he should be carried into court, he might take a notion to say that this was something approaching unlawful search. He might even call the attention of the court to the decision of the United States Supreme Court that even a subpoena duces tecum must be specific as to the information desired with particularity as to the exact persons involved and that even then the information need be surrendered only when a criminal prosecution is in progress. It was going a little too far to expect that, as the lawyers put it, the bureau of coal economics could get the authority of a court to go on "a fishing trip" through the books of a coal company or a coal consumer and drag out such information as might possibly interest its director. Certainly it was very doubtful whether compliance with such an order could be enforced in the courts. There was, however, a more clever way around it.

When in 1922 some volunteer regulators in Washington were trying to fix the maximum price of coal—without any legal authority for doing it—a device was quickly rigged up by which a volunteer committee was sent into the coal field. And these volunteer committeemen decided that unless an operator should consent to fix the prescribed maximum prices on his coal and to send it to the persons designated by the committee that that operator should have no cars. The device was, to say the least, extra legal even in the most severe emergency. No operator thought to question it because most of the operators didn't care. They passed over it, at any rate, as one of the vagaries of Washington action attributable more to zeal and altruism than compliance with the spirit and letter of the law.

However, now that device comes back in an entirely different dress. The Oddie bill proposes that if any person—producer, merchant or user—shall refuse to surrender the desired information about his coal production, sales or consumption in the desired form—regardless of cost—the bureau of coal economics may specify his delinquency to the Interstate Commerce Commission and upon receipt of same the Interstate Commerce Commission shall refuse to supply him with cars to move coal for or to him, or on his account until the information desired has been surrendered. That is to say, compliance with this law is not going to be enforced by legal but by economical pressure.

The bill, as a whole, is an interesting study because it becomes the camping grounds of all the old theories advanced as to the methods by which coal should be regulated. These two outstanding features of it are perhaps enough to condemn the whole project. However, it is hardly worth while now to discuss at length a measure which has such slim chance of passage at this session.

HARD MONEY

HOW long has it been since you have seen a silver dollar? Many months, possibly, unless you have been in the West.

The nature of a circulating medium is largely one of habit and custom on the part of the people. West of the Mississippi River the silver dollar has always circulated freely, and the further west you go the more marked the preference for it over paper money becomes.

Announcement is made of the plan of the Treasury Department to issue into circulation 40,000,000 silver dollars. These are to replace a similar amount of paper currency. The cost of maintaining paper currency is so much higher than that of coin that it is estimated that this will mean a saving of about a million dollars a year to the government. The action is commendable, therefore, for three reasons:

1. For the saving to the government itself;
2. For the idea of thrift which, it is hoped, will be inculcated in the public mind by the handling of hard money; and
3. In the further stabilization of silver as a circulating medium.

With reappearance of the silver dollar which the plan of the Treasury Department is hoped to bring about will come, therefore, a saving to the government and, it is somewhat hopefully suggested, a better understanding of thrift on the part of the people. It is a thoroughly commendable project.

THE ANTHRACITE TAX

WITH the reassembling of the state legislatures many old and some new questions are appearing for consideration. Among them is, in the State of Pennsylvania, a possible reconsideration of the tax on anthracite production. This becomes decidedly important for the reason that the whole people are now trying to limit the tax burden imposed by the federal and the state taxing powers.

To a very large extent, President Coolidge has been able to control federal extravagance. That is, he has stopped the increase of federal taxes and has begun a gradual reduction of them through the wiping out of fractions, here and there, of the bureau growth and departmental open-handedness. There are still many handicaps to overcome, such, for example, as the soldiers' bonus, and the agitation for the department of

education, the child labor bureau, the department of mines, a new coal commission, a new rent commission for the District of Columbia, and a farm products control commission.

With the federal question partially in hand, attention is being turned toward control of extravagance by the states. Coming under this latter heading is the anthracite tax. If the state legislatures can collect the money on anthracite production, it is obvious that they are going to spend it. That is, it will not be used to reduce other taxes; it will simply be used to increase the extravagance of the state political machinists. That raises the fundamental question whether an industry like anthracite, which is struggling against economic difficulties, should have an extra tax burden cast upon it.

No one who knows anything about anthracite can possibly deny that, if it ever did enjoy any days of ease, those days have long since passed. There was a time when most of the anthracite was produced from the veins which relatively were easy to mine. In those days the production was taken from the thicker and more level seams. The resources of such veins dwindled in time and, the demand for anthracite continuing, the operators had to work the thinner veins and many of them through the same shaft. They had also to go into the areas where the veins were no longer level and thick but where they were thin and broken. The operators could not take only the coal which was easily reached; they had to take anything that was anthracite. And as they got into these forbidding areas, they got into physical difficulties which increased the cost of production. That increased cost obviously meant an increased price.

Also, as the work became more difficult, the miners put their affairs into the hands of a labor monopoly, and in consequence they were paid better and worked less. This increased the cost and also forced an increase in the selling price.

The two increases in cost and the two increases in selling price put the market price of the product up to a point where the people began to rebel. And it was when the industry was in this rather delicate condition that the officials of the states began to lay on their heaviest tax burdens. It has been an open secret for years that the county officials will encourage any kind of an investigation of anthracite in the hope that out of it they will be able to disclose more value in certain properties which will become subject to local taxation. Therefore, it is no secret at all that the counties wring from the anthracite industry every conceivable dollar of tax money.

In the meantime, the Federal Government must also have from the income of the anthracite corporations its share of taxes to support the numerous organizations and movements for which Washington has become sponsor.

Now the State of Pennsylvania, standing between these two extremes, has seen fit to impose a third tax or a percentage tax on the production of anthracite. That is to say, the county taxes the property; the state taxes the production; and the Federal Government taxes the income derived from the sale of the product. There isn't a phase of anthracite which doesn't have to stand and help to support one of three kinds of legislative extravagance.

The unfortunate part of it is that these burdens are heaviest and seem to grow the fastest at a time when the economic difficulties of the industry are proving ruinous. The state legislature, meeting to debate the tax question, may do well to consider whether there isn't a straw which will break the back of even the sturdiest anthracite camel.

THE OIL REPORT

THE majority report of the oil investigating committee of the Senate was adopted by that body by a partisan vote; that is, the adoption of the report was possible only because the so-called progressive bloc voted with the Democratic minority to sustain it. The report was made before election and the people paid no attention to it. It has been adopted, and no one believes that the courts will pay any attention to it. The validity of the oil leases is a question of law for judges to decide. The criminality of individuals is a question of fact for juries to determine.

The matter of the naval reserve leases is pending in the courts. The courts may decide that the executive order transferring the naval reserves from the Navy Department to the Interior Department was in comformity with the law or they may hold otherwise. Juries may decide that the money received by ex-Secretary Fall was a loan which had no bearing on the leasing negotiations or they may hold that the transaction was in the nature of a bribe. And, irrespective of the questions of illegality and criminality, the weight of opinion of expert witnesses may show that the leases were necessary, from a practical standpoint, in order to save the oil from partial or total exhaustion through competing wells surrounding the reserves. Many eminent geologists hold this view, and their reasons are logical, plausible, and sound. In this case it is necessary to consider weight of expert opinion, especially when that consensus of opinion is unbiased by partisanship or personal animosity and is based strictly upon facts and technical considerations. Weight of opinion has been in favor of the leases as a means of saving the oil.

In the proceedings now pending in the courts, the testimony of witnesses will not be twisted and distorted in such a manner as to support, by inference and innuendo, the indictments of individuals or the charges of fraud and illegality in the consummation of the leases. Until the testimony is all in, and the juries have brought in their verdicts, and the judges have determined the questions of law, the people of the United States will continue to withhold judgment on the whole matter, as they have in the past. If the leases are found to be illegal, the people of the nation will demand that Congress take immediate steps to protect the interests of the Government by some other effective measure against the draining of these reserves. If those charged with fraud and conspiracy against the Government are convicted, the people will be glad to see the guilty punished, no matter who they may be or what position they have held. The report adopted by the Senate is not convincing, it settled nothing, and it means nothing except as an exhibition of partisanship which has already met its defeat at the hands of the people.

NO RAILROAD LEGISLATION

THE probability that the railroad situation will not be disturbed by any act of this Congress is pleasing to both the railroads and the shippers. Developments in the field of transportation during 1924 afford a sound basis for the slogan: "Leave the railroads alone." Results were accomplished that can be accounted for only by rigid economy and increased efficiency in railroad operations that have been effected under intelligent and efficient private management and by widespread cooperation with shippers.

The MINING CONGRESS JOURNAL has been opposed to railroad legislation during the period of convalescence through which the rail carriers have been passing. But it has been consistent in its contention that if legislation

is enacted for the purpose of securing rate relief for the agricultural industry, legislation should not be confined to a single basic industry but should apply to all basic industries—producers of basic raw materials—which includes the mining industry. President Coolidge reflected this view in his annual message, when he referred to "better equalization of rates between different classes of traffic so as to relieve undue burdens upon agricultural products and raw materials generally."

Freedom from experimental legislation has enabled the carriers to obtain operating results that are highly satisfactory. Additions to car and locomotive equipment, improvements in main-line trackage and terminal facilities, and the revival of healthy competition in railroad service all tend toward enhanced earnings, increased efficiency, and improved credit. Continued strides in this direction should lead eventually to rate relief for mining and other basic industries. In any event, there is more reason to hope for rate relief if the roads are not interfered with than if Congress acts.

Numerous instances can be cited where the railroads have voluntarily reduced rates on basic commodities during the last four years. And, in some instances, the reductions have brought the rates down almost to the pre-war level. Both the mining and agricultural industries have benefited, and there is every reason to believe that further voluntary reductions will be made as rapidly as the carriers' earnings will permit.

The campaign of the American Mining Congress for recognition of the principle that rates on basic raw materials must be maintained at that level which will induce the largest volume of traffic and insure the greatest reserves of potential tonnage for the future is bearing fruit. The carriers are realizing that potential traffic is in a large measure dependent upon existing rate levels which must not be so high as to compel the sacrificing of vast mineral reserves by exploitation of the high-grade ores. The mining industry can afford to view with optimism the transportation situation.

DISTANCE LENDS ENCHANTMENT

EACH year following the convention of the American Mining Congress, serious reprovings and chidings for the major features of the convention are broadcast by our chief contemporary, the *Engineering and Mining Journal-Press*, whose name throughout the years has become more and more mouth-filling as it has by the gentle process of absorption taken over its contemporaries. We sometimes feel that if by similar process of absorption it might change its name to the Engineering and American Mining Journal Press that all such indivious comments might disappear. However, be that as it may, it is not our ambition to take part as either of the participants in an eclipse.

The recent comment in this publication in criticism of the Sacramento convention speaks in glowing terms of the prior convention at Denver four years ago. "Ah, there was a meeting!" says the *Engineering and Mining Journal-Press*. Back through the pages of that publication and in our own memory following the Denver convention, we seem to remember the same critical comments of our activities then and there. One of the efforts most criticized at the Denver convention was the substantial form which the work in behalf of tariff for the mineral industry took at that time. The result two years later shown in the incorporation in the Fordney-McCumber tariff bill of more adequate protection for the mining industry than has ever before been achieved has resulted in a concrete benefit which has meant much to the industry, which both the *Engineering and Mining Journal-Press* and the American Mining Congress are purposed to serve. Yet their criticism then and thereafter of this activity was most caustic. It would seem that as these conventions recede into the past the sharp lines of competition which our contemporary seems to see in our activities gradually merge themselves into the more pleasing lines of the common benefit achieved for the mining industry.

SAFETY SENTINELS

AT no time has there been more diversified, yet more coordinated, effort to prevent accidents. The creation of the United States Bureau of Mines was predicated upon safety work, and that work since has resulted in accident prevention organization at practically all mines. The "Safety First" movement has gained volume until we have not only the work of the Bureau and mining companies but that of the National Safety Council and state organizations along similar lines.

Manufacturers of equipment have done great work in accident prevention and their cooperation with mine operators has resulted in new and improved methods of life-saving equipment, as witness the development of oxygen, fire-fighting and rock-dusting equipment, together with safety rules for uses of electricity underground.

Early in the work the system of awarding prizes to safety teams showing the greatest efficiency was employed with gratifying results. The Annual First-Aid Meet awards its trophy, the Joseph A. Holmes Safety Association its trophy, and so on along the line. The most recent step forward is that of the Hercules Powder Company, through the Explosives Engineer trophy—"Sentinels of Safety"—which is to be awarded annually at the First-Aid Meet. Rules concerning the awarding of this trophy are available either from the Bureau of Mines or the Explosives Engineer.

The American Mining Congress sponsored the first effort for mine safety—that of the creation of the Bureau of Mines—and has continuously endorsed and assisted every constructive effort for the reduction of mine accidents. This further effort is a worthy one, and should receive the cooperation of the mining industry.

INTERFERENCE WITH PROSPECTING

IN the opinion of officials of the General Land Office, the public lands problems confronting the mining industry are much more serious in connection with railroad selections than the stock-raising homestead entries and leases.

It is claimed that the General Land Office some time ago adopted the policy of endeavoring to assist in the settlement of disputes arising over conflicts of interest under the stock-raising law, and that many disputes have been settled in this way with little, if any, expense to the parties involved.

But the authority of the General Land Office is limited. It cannot intervene until mineral has been discovered. Where prospecting is undertaken without actual evidence of the existence of mineral, the prospector, under the existing law and regulations has no recourse against the homesteader even though mineral rights in the land are reserved to the Government.

Efforts are being made to solve these problems, both as to prospecting on homestead entries and on railroad selections. Until the right to prospect is held paramount to surface usage for grazing purposes, these efforts should be vigorously promoted.

GOLD AND SILVER RELIEF RECOMMENDED BY COMMISSION

Tax Exemption For Gold Mining And Lower Taxes On All Mining—Freight Rate Reductions—Uniform Blue Sky Regulation—Water Rights For Mines—Colorado Ore Smelting Inquiry

IMPORTANT recommendations in behalf of the gold and silver mining industry are made by Fletcher Hamilton in a report to the Senate Gold and Silver Commission, based on testimony of producers conducted in various western States. He says the normal gold production of 1914 and 1915 cannot be resumed until the price level returns to the pre-war basis. "If the government should require in the near future a normal production of gold it could be obtained only by making a compensatory adjustment of the present price level on the basis of the 1913 price level," he says. "If the price level continues to increase as it has in the last half of 1924, such a remedy would have to be applied promptly unless the government is prepared to meet a declining production, which is now 50 percent normal, and unless it can afford to assume the liability of wastage in gold ore reserves which will continue to take place through the process of selective mining and the shutting down of mines. As gold is by law at a fixed price such compensatory adjustments to the producers could not be regarded as preferential treatment for the gold mining industry as compared with other producing commodities whose prices move in accordance with the law of supply and demand. Gold mining is not an industry into which and from which capital can readily be shifted. It will not be possible under short notice to reestablish normal conditions in the gold mining industry and the government should be informed of the serious condition which now exists, that it may take necessary precautions to safeguard the plant and equipment now installed and the capital now invested, so that gold may be available when most needed."

Tax Exemption

He recommends income tax exemption for the gold mining industry because of its depressed condition and the capital which has been destroyed through adverse economic changes. He believes the gold mining industry should be relieved of all government taxation, which action would stimulate prospecting and make capital more readily available for investment in the industry. There has been a great wastage in gold ore reserves which has not been replaced through discovery and development of new mines. Operating conditions are not sufficiently profitable to provide an inducement.

Mr. Hamilton says the mining industry in Arizona has contributed 50 percent of the taxes collected in that State. He says the greater tax burdens on mining are those imposed by the States. "High taxes restrict the volume of ore which could be mined at a profit and thereby reduce ore reserves," says Mr. Hamilton.

Discussing mine finance, Mr. Hamilton says the mining industry has difficulty in securing capital because of competition of tax-free securities. He favors extending credit to the nonferrous metal mining industry along the lines of credits to farmers.

Mr. Hamilton says the mining industry made bitter comment on the attitude of the government toward it as reflected in a Treasury circular criticizing mining stocks. He says this circular has injured the mining industry and discouraged efforts to restore it to a normal condition. He asks that government agencies assist and encourage the mining industry.

Blue Sky Regulations

Mr. Hamilton says great injustice has been caused the mining industry by Blue Sky laws, under which it has been impossible to finance new mining operations. He recommends that the commission study the State Blue Sky laws and formulate a uniform and satisfactory method of regulation, which will restrict fraudulent transactions, while permitting normal development of the industry.

Mr. Hamilton says it has been difficult to determine the responsibility for treatment of mineral claimants in forest reservations and recommends that the commission take steps to remedy conditions which are found detrimental to the mining industry.

Reference is made to the confusing method of disposing of public lands. There are complicated cases between mineral locators and homesteaders which have led to discontent among pioneers, prospectors, and operators in western public land States. It is recommended that the commission consider the matter of determining the rights of mineral locators in order to bring about a classification of mineral lands which will protect mineral rights of the mining industry and free such lands from other claims of entry until it is proven that they are nonmineral in character and to relieve mineral locators from future conflict with homestead entries.

It is recommended that full consideration be given to the needs of the mining industry in development of plans for water utilization in California. It is pointed out that if irrigation and other developments do not take into account provision of water for hydraulic operations, it may not be possible to work gravel deposits. It is recommended that investigation be made of the placer gold resources of California and water supply necessary to gold recovery. It is suggested that water in placer mining districts be distributed so as to accommodate irrigation, power development, navigation, flood control and mining. It is pointed out that the value of gold recovered from such deposits will be sufficient to sustain the cost of all development.

Smelting and Marketing

As to smelting and marketing, Mr. Hamilton says that complaint has been made in Arizona, Colorado, Idaho, Montana and Utah against high smelting rates and deductions made by smelters. It is stated that competition exists among smelting companies in some States, but that in others, such as Colorado, all of the mines are dependent, with the exception of one large custom gold milling plant, upon smelting companies as an ore market. Many mines in Colorado have been forced to close because of lack of a satisfactory ore market, because of the distance from smelting points, difficulties of transportation, inability of smelters to treat certain classes of ore, and because smelting operations have been reduced to two points in Colorado.

It is said that the investigation being conducted by the commission as to the cost of producing and marketing gold and silver will develop information on smelter rates and deductions.

Mr. Hamilton recommends a special study of the ore marketing problem in Colorado because of the peculiar conditions existing in that State, in order to relieve the present unsatisfactory situation. This investigation should cover the general smelting situation in Colorado to determine whether smelting facilities could be provided at lower cost for various classes of ore, and should be conducted in cooperation with the smelting companies.

The commission is asked to request the Interstate Commerce Commission to adjust freight rates for the benefit of the mining industry. It is suggested that freight rates be reduced on ores and other mining products as an inducement to development of increased freight tonnage. It is sug- (*Continued on page* 94)

PRACTICAL EFFECTS OF VARYING INCOME TAX RATES ON INCOMES OF INDIVIDUALS, TRUSTS, CORPORATIONS

By A Comparison Of Differences In Taxation Of Individuals, Trusts And Corporations Under Federal Tax Laws, Mr. Fernald Illustrates How Tax Liability May Be Affected By The Nature Of The Taxable Unit Receiving The Income

By HENRY B. FERNALD *

THREE units for taxation are recognized by the present federal income tax law, as they were recognized by prior laws; viz., the individual, the trust, or the corporation. The partnership is not recognized as a taxable unit, but all income of a partnership is taxable to the members of the partnership as if each received individually his proportionate share of the partnership income for the fiscal year of the partnership which coincides with or terminates within the taxable year of the individual.

In the Revenue Act of 1924, sections 210 and 211 impose a tax "upon the net income of every individual." Section 219 makes this tax "apply to the income of estates or of any kind of property held in trust." Section 230 imposes a tax "upon the net income of every corporation," and by section 2 (a) (2) "the term 'corporation' includes associations, joint-stock companies, and insurance companies." Certain exemptions exist in each case, but with these we are not here concerned.

What constitutes a "trust" as distinguished from a "corporation," and what income is to be considered as taxable to an individual, a trust or a corporation, have been subjects for numerous decisions of great importance, but which cannot be discussed within the limits of this paper. It might, however, be mentioned that many so-called "trusts"—such as "Massachusetts trusts," etc.—are held not to be "trusts" within the meaning of section 219 of the revenue act, but are rather to be considered as "corporations" taxable under section 230.

The definitions of income are practically the same for the individual, the trust or the corporation. There are certain differences, but except for those later referred to they do not seem material for this discussion. Whatever the "income" of an individual, a trust or a corporation is here referred to, it is understood to mean the "net taxable income" as defined by the revenue act; and it is assumed, unless reference is made to the contrary, that wherever comparative taxes are stated for specified amounts of income the income under consideration is such as would under the law all be taxable whether it were received by an individual, a corporation or a trust.

* Of Loomis, Suffern & Fernald, certified public accountants, New York; member of General Tax Committee, American Mining Congress.

The differences in taxation of an individual, a trust and a corporation are not so much in the nature of the income which is taxable to each as they are in the rates of taxation which are applicable

Henry B. Fernald

to the same income dependent upon whether it is to be considered as taxable to an individual, a trust or a corporation, and the time when it becomes so taxable.

The bases which the law provides for taxation of each of these units may be briefly summarized to bring out these differences, as follows:

FOR THE INDIVIDUAL

The normal tax on income (section 210) is 6 percent (but only 2 percent for the first $4,000 and 4 percent on the second $4,000). This normal tax does not apply to dividends of domestic corporations or of foreign corporations 50 percent of whose income for three years preceding was from sources within the United States.

In addition there is the surtax (section 211), graduated according to the total amount of the income (including dividends). The amounts of such surtax for certain typical amounts of income are as follows:

For Unmarried Person or for Trust Estate

Net income	Maximum surtax rate	Total surtax	Normal tax	Total tax
$10,000	None	None	$300	$300
25,000	7%	$510	1,200	1,710
50,000	17	3,540	2,700	6,240
100,000	36	17,020	5,700	22,720
200,000	37	54,020	11,700	65,720
400,000	39	131,020	23,700	154,720
600,000	40	210,020	35,700	245,720

In lieu of the above normal and surtaxes there is the special tax of 12½ percent on "capital gains" or "capital losses" (section 208), which are gains or losses from sale or exchange of capital assets which have been held by the taxpayer for more than two years, but not including property which should be included in an inventory or property "held by the taxpayer primarily for sale in the course of his trade or business."

A reduction of 25 percent is made in the tax on "earned income," but since all income up to $5,000 and no income in excess of $10,000 is considered "earned," this provision need not here be seriously considered. The reduction thus made in the amount of tax cannot possibly exceed $75.

FOR THE TRUST

The tax rates for estates or trusts are the same as for individuals (section 219).

The entire net income of the trust is taxable to the trust as an entity (and the tax is payable by the fiduciary), except:

1. Amounts paid under the will or deed of trust for religious, charitable and similar purposes.

2. "The amount of the income of the estate or trust for its taxable year which is to be distributed currently by the fiduciary to the beneficiaries" or income collected by an infant's guardian which is held or distributed, as the court may direct.

3. In case of estates of deceased persons during the period of administration, and in case of income which, in the discretion of the trustee, may be either distributed or accumulated, "the amount

of the income of the estate or trust for its taxable year which is properly paid or credited during such year to any legatee, heir or beneficiary."

Amounts specified under 2 and 3 above on which the tax is not payable by the fiduciary "shall be included in computing the net income of the beneficiaries."

"However, if the grantor of the trust "has at any time during the taxable year" the power to revest in himself title to any part of the corpus of the trust, or if any part of the income of the trust may, in the discretion of the grantor, be distributed to the grantor or be held or accumulated for future distribution to him, or if any part of the income of a trust is or may be applied to payment of premiums on policies of insurance on the life of the grantor, then such income "shall be included in computing the net income of the grantor."

Dividends received by an estate or trust are exempt from the normal tax but subject to the surtax. To the extent to which the income is taxable to an individual beneficiary he is entitled to his proportionate share of such exemption.

The general result of these provisions may be illustrated as follows:

(a) For $400,000 income of a trust, all from dividends, and all taxable to the trust, the total tax (surtax) would be $131,020, with a maximum tax rate of 39 percent.

(b) If this $400,000 were all currently distributable to one individual, the trust would pay no tax but the individual would pay on the entire $400,000 the $131,020 tax.

(c) For the same income, if one-half taxable to the trust and one-half taxable to an individual beneficiary, each would pay on $200,000 a tax of $54,020, with a maximum tax rate of 37 percent; a total tax on $400,000 of $108,040, being $22,980 less than if the entire $400,000 had been taxable all to the trust or all to a single individual.

(d) If this same $400,000 of income were taxable $100,000 to the trust and $100,000 each to three beneficiaries, then the tax for each would be $17,020, with a maximum tax rate of 36 percent; a total tax on $400,000 of $68,080, being $62,940 less than if the entire $400,000 had been taxable all to the trust or all to a single individual.

If none of this income were from dividends, so that the normal tax as well as surtax were to be computed, the normal tax on $400,000 taxable to a trust or to an unmarried individual would amount to an additional $23,700; on two units of $200,000 the normal tax would be $11,700 each, or a total of $23,400. The difference of $300 is due to the $1,000 exemption and to the 2 percent and 4 percent rates applicable to the first $8,000 of taxable income. In the case of married persons and persons with dependents the increased exemptions would somewhat reduce the normal tax, but not sufficiently to be any material factor in the consideration of large incomes.

For the Corporation

The income tax (section 230 of the law) is at a flat rate of 12½ percent of the net income, but under section 234 (a) (6) the net income subject to this tax does not include the amount of dividends received from a domestic corporation or from a foreign corporation if 50 percent or more of the income of such foreign corporation for three years preceding was from sources within the United States.

By section 220 of the law, "If any corporation, however created or organized, is formed or availed of for the purpose of preventing the imposition of the surtax upon its shareholders through the medium of permitting its gains and profits to accumulate instead of being divided or distributed," an additional tax is imposed of 50 percent of its net income, including dividends received and interest on certain obligations of the United States.

This same law continues the federal capital stock tax (section 700). This is not an income tax but is "a special excise tax with respect to carrying on or doing business" equivalent to $1 per $1,000 of "the fair average value of its capital stock for the preceding year." This tax cannot be reduced to a fixed percentage on income because it is payable irrespective of whether the corporation makes a profit or a loss.

The percentage of this tax to taxable income (if there is a taxable income) will vary inversely as the ratio of taxable income to the "fair average value" (not par value) of the capital stock. Since the tax is one-tenth of 1 percent of the fair value of the capital stock, it will be equivalent to the following percentages of taxable income (to cite certain typical examples):

Percentage of taxable income to value of stock	Percentage of capital stock tax to taxable income
5%	2%
6 2/3	1½
10	1
20	½
40	¼

Accordingly, if the net taxable income of a corporation is 5 percent of the value of its stock (as appraised for capital stock tax purposes) its income tax of 12½ percent plus its capital stock tax will be equivalent to a total tax of 14½ percent of its taxable income. If the net taxable income is 10 percent of the value of its stock, the total of income tax and capital stock tax will be equivalent to 13½ percent of its net taxable income.

Although this capital stock tax may sometimes be an important factor for consideration, it cannot be taken into account in the computations here presented because its amount does not bear any fixed relation to the amount of taxable income.

Let us consider, then, the possible tax upon $400,000 of taxable income received by a corporation and distributed by it in a single year to a trust or to an unmarried individual who was its sole stockholder:

The corporation would pay 12½ percent tax on $400,000.....	$50,000
The individual or the trust would pay (if taxable upon the entire balance of $350,000 paid to it as dividends) surtax on $350,000.....	111,520
	$161,520

If, however, one-half the income of the trust were currently distributable to a beneficiary the computation would be as follows:

The corporation would pay 12½ percent tax on $400,000.....	$50,000
The trust would pay surtax on $175,000	44,770
The individual would pay surtax on $175,000.....	44,770
	$139,540

The saving through creation of an additional taxable unit would thus be $21,980.

This tax of $139,540 is the same amount as would be payable if the corporation made its distribution to two separate stockholders, each owning one-half its stock.

If, further, the dividends were taxable one-fourth to the trust and one-fourth to each of three beneficiaries the result would be:

The corporation would pay 12½ percent tax on $400,000.....	$50,000
The trust and each of the individuals would pay surtax on $87,500=$12,745 each....	50,980
	$100,980

If the corporation which earned $400,000 in a year distributed the $350,000 remaining after paying its tax to a single stockholder in two different years at $175,000 each year, the total tax would be $139,540; the same as if the distribution were made to two equal stockholders.

A tabulation of these different amounts of tax for the same taxable income would show:

For income of $400,000	Amt. tax
Case I.—Received directly by and fully taxable to a single individual or a trust (normal tax and surtax).....	$154,720
Case II.—Received by a trust but taxable one-half to the trust and one-half to a beneficiary (normal tax and surtax $65,720 each).....	131,440
Case III.—Received by a trust but taxable one-fourth to the trust and one-fourth each to three beneficiaries (normal tax and surtax $22,720 each)	90,880

Case IV.—Received by a corporation and distributed in a single year and all taxable to a single individual or trust (corporation tax and individual surtax)	161,520
Case V.—Received by a corporation and distributed to two taxable units; viz., distributed in a single year but taxable one-half each to two stockholders, or taxable one-half to a trust and one-half to a beneficiary; or distributed to a single individual one-half in each of two years (corporation tax and individual surtaxes)	139,540
Case VI.—Received by a corporation and distributed to four taxable units	100,980

The income tax cost of receiving income through a corporation instead of directly by the individual, or through a trust, is, in Case IV as compared with Case I, $6,800.

The corporation pays its 12½ percent tax		$50,000
The individual does not then pay:		
Normal tax on $400,000	$23,700	
Surtax of 39 percent on $50,000	19,500	
		43,200
Net cost of receiving this $400,000 income through the corporation		$6,800

Similarly in Case V as compared with Case II, the additional cost is $8,100; and in Case VI as compared with Case III it is $10,100.

If, however, Case I be compared with Case V, it will be seen that an individual who receives directly this $400,000 income in a year would pay $15,180 more income tax than if this income were received by a corporation and dividend distributions were made to two taxable units or in two taxable periods.

It need hardly be said that in all these cases the $400,000 income here under consideration is assumed to be the only income which would be received.

Manifestly, the lowest tax would be paid if income were received by the corporation and not distributed by it, because then only the 12½ percent corporation tax would be payable, which on $400,000 income would be $50,000. The law recognizes that its high surtax rates furnish a great temptation to do this. So it imposes the 50 percent penalty tax of section 220 if a corporation "is formed or availed of for the purpose of preventing the imposition of the surtax upon its shareholders through the medium of permitting its gains and profits to accumulate instead of being divided or distributed." How far the department will attempt to go in imposing this tax or the extent to which it will be sustained by the courts seems difficult to say. This section was never intended, however, to be used as a club to compel the distribution of moneys which are actually needed in the business of the corporation.

It is not uncommon to find, particularly in a new or growing business, that a substantial part of the profits earned are not available for immediate withdrawal. If such a business is conducted by an individual, he must pay his full surtax based on the entire income earned during the year. The corporation would similarly pay its corporation tax of 12½ percent on the entire income, but the stockholder would only pay his surtax when and as the income became distributable.

The recent conditions might also be cited where several years' profits were only sufficient to make good prior losses. If business was conducted by an individual or a partnership full surtaxes had to be paid on each year's profits, even though the profits were all absorbed by prior losses. The corporation, however, was not required to pay any dividends, at least until it made up any impairment of surplus. This condition is now somewhat mitigated by section 206, which permits a "net loss" of one year to be deducted from income of a succeeding year, but this provision will often fail to give the individual as great relief as it gives to the corporation.

Another feature to be noted is that income accrued is not always income distributable. Perhaps a large part of the year's income may be represented by accounts receivable outstanding at the close of the year. Before these are collected losses may occur which would leave no profits for a corporation to distribute. An individual would have to pay full surtax on the profits when they accrued even though he was never able to withdraw the money from the business.

The corporation may thus have a distinct advantage in preventing the imposition of excessive surtaxes on income which has accrued but which is not withdrawable from the business. The law is not intended to prevent the proper use of the corporate form of doing business although it is intended to prevent the improper use of the corporation as a refuge from surtax payments.

The capital gain and loss provisions of section 208 bring about some peculiar situations. If "capital assets"—i. e., property held by the taxpayer for more than two years, but not including stock in trade, etc., or property held primarily for sale in the course of his trade or business—are sold or exchanged with a taxable gain, a tax limit is given of 12½ percent on such "capital net gain"; if the result is a loss, the tax otherwise payable can only be reduced by 12½ percent of the "capital net loss." The capital gain provision was introduced into the law because of the paralizing effect on business and the great inequity of taxing at the maximum surtax rates applicable to a single year the profits which had accumulated over several years. The capital loss provision was then introduced because it was considered unfair that capital gains should be taxable at only 12½ percent, whereas capital losses might be applied to offset income which would otherwise be taxable at much higher rates. Accordingly, if such property had been held less than two years, a gain from its sale might be taxable at rates as high as 46 percent or a loss might reduce the tax otherwise payable by 46 percent of such loss. But if the same property were held for over two years the gain would only be taxable at 12½ percent or the loss would mean a reduction of only 12½ percent.

No such provision was necessary as to corporations because the corporation tax is 12½ percent in any event.

If, then, property which had been held by an individual since March 1, 1913, and which had a then value of $100,000, were sold by him in 1924 for $500,000, he would pay a tax of 12½ percent on $400,000; i. e., $50,000. If, however, this property had been similarly owned and sold by a corporation, the corporation would pay its tax of $50,000, and if it distributed the remaining $350,000 in a single year to one individual stockholder as an ordinary dividend he would have to pay his full surtax of $111,520 thereon, making a total tax thereon of $161,520.

But if conditions were such that the corporation could make its distribution by cancellation or redemption of its stock, then by section 201 (c) such a liquidating dividend would be treated as a sale of stock and taxable as a gain from sale of property. If the stockholder had the same proportionate basis for computing gain on sale of his stock as the corporation had for computing its gain on sale of the property, and he received $450,000 (being the $500,000 selling

Treasury Annex, Internal Revenue Department

price less $50,000 corporation tax) in retirement of stock which had cost him $100,000 (or which had that value at March 1, 1913, and was then owned by him) and if such stockholder had held his stock for over two years, then he would only be taxable at 12½ percent on $350,000, or $43,750; making a total tax for corporation and stockholder of $93,750. If such stockholder had not held his stock for two years, then he would have to pay both normal tax and surtax on the $350,000, or $132,220; making the total corporation and individual tax $182,220.

The stockholder's basis for computing gain or loss on his stock may be entirely different from the corporation's basis for computing gain or loss on its property. The corporation might have a basis of $100,000, representing the cost to it or the March 1, 1913, value of its property. This would continue to be the base for the corporation so long as it held such property, irrespective of what might be the cost to its stockholders of the stock which each owned. The corporation might, therefore, have its $100,000 base for the property, whereas a stockholder might have a base for his stock which would be substantially more or less than the base for the corporation. Consequently, the case might be presented where a corporation would sell all of its property with a gain to it of $400,000 because its base for the property was $100,000, whereas a stockholder might have paid $400,000 for his stock so he would have a gain of $100,000 on liquidation of the corporation. This difference between the basis for the corporation and for the individual seems fairly well covered in the case of corporate liquidations. The difference is not at all recognized in the case of ordinary dividends. If the corporation, having realized the $400,000 gain to it from sale of property, should distribute this as an ordinary dividend to its stockholders, the stockholder would be taxable thereon, as above noted, without any recognition of the fact that a large part of this dividend was simply a return to him of his capital investment. About the only manner in which he could prevent such an inequity would be by selling his stock (or by a liquidating dividend which has the same status under the law), in which case recognition would be given to his own base instead of that of the corporation.

Another distinction which must be recognized in regard to capital gains and losses is that the two-year period relates to the time when the taxpayer has owned the property of which he disposes. The fact that the corporation may have owned its property for over two years does not give to a stockholder who receives a liquidating dividend a right to compute capital gain thereon unless he has owned his stock for the two-year period. It should also be noted that in the case of an estate or trust the two-year period dates from the time when the property passed to the estate or trust and not to the period when it was originally acquired by the creator of the trust.

Distributions from depletion or depreciation constitute a notable instance of the failure of the law to recognize the difference in base between the corporation and the stockholder. The corporation may have its property valued for purposes of depreciation and depletion on a basis which would be equivalent to $100 per share. One stockholder may have purchased his stock at $50 per share; another at $150 per share. Perhaps a provision might have been made in the law whereby each stockholder's taxability for distributions to him would be determined on his own basis for the stock so that the stockholder who had paid $150 per share for his stock would compute the taxability of his distributions making an allowance for three times the depletion and depreciation allowable to the stockholder who had paid $50 for his stock. Criticism can hardly be made because the law did not add all these possible complications to those which already exist. In some cases, therefore, the stockholders will receive distributions from depletion and depreciation reserves which have been computed on a basis higher than the cost to them of their stock. There will probably be many more cases in which the basis used by the corporation will be less than that which would correspond to the price paid by the stockholder for his stock. As a result, some stockholders will receive a return of capital somewhat more rapidly than they should to correspond to their own investment in the stock, but more stockholders will receive allowances for return of capital more slowly than their investment in the stock would really be entitled to. This will in general be adjusted when the stockholder sells his stock and becomes taxable upon a gain or is allowed to deduct a loss. Some stockholders may suffer through having a loss when they sell the stock in excess of the gain against which such loss may be applied or by having their loss subject to the 12½ percent limitation, whereas they may have been paying a much higher tax rate on dividends they had received.

This comparison of practical effects of varying income tax rates on the incomes of individuals, trusts and corporations might be continued through a wide range of transactions and for varying amounts of income. Such a discussion as this cannot pretend adequately to cover the many conditions which may arise and the many different provisions of the law which may have an important bearing in each case. Perhaps what has here been said may serve to illustrate how much the amount of the tax to be paid may be affected by the nature of the taxable unit which receives the income. There can be no thought that everyone can so arrange his affairs that he will always be able to take advantage of the minimum rate applicable to every transaction. He may, however, with all propriety give some attention to seeing that he does not so conduct his affairs as to subject himself to the payment of an unnecessarily high tax. Perhaps more attention given to these questions before the tax attachés would mean less criticism of unfairness and inequalities in the law.

Most of the mines of South America might more accurately be called high rather than deep. In Chile one of the big copper mines opened in recent times is entered at the bottom and worked up. The copper mines at Cerro de Pasco in Peru are about 1,000 feet deep, though they are at an elevation of 14,000 feet above sea level. The St. John del Rey gold mine in Brazil is the deepest in the world. It is worked to a depth of 6,726 feet. Holes have been bored much deeper into the earth than mine workings have penetrated. What is believed to be the deepest hole in the earth is one in West Virginia, which was bored 7,579 feet in search of natural gas.

Membership in the American Federation of Labor continues to decrease, according to the report of the committee presented at the recent convention at El Paso, and covering the twelve months ended August 31, 1924. The Federation on that date was composed of 107 national and international unions, 48 state federations, and 855 city central bodies. The number of city centrals decreased 46 during the year. The Federation included 458 local trade and federal labor unions, four departments, and 764 local department councils, the latter decreasing 54 during the year. The number of local unions in the membership was 32,157, a decrease of 4,377 in the twelve months ended August 31. The average paid-up membership of individuals was 2,865,979, a decrease of 60,489 from the previous year.

The Bureau of Mines reports that experimental work in the production of sponge iron conducted by it at the Seattle experiment station has advanced to the point where it is believed that industrial applications of the process can be considered for the production of sponge iron as a metallurgical reagent for the precipitation of copper, lead, and numerous other metals from solution.

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"Transmuted into marble, rugged and alone and mute, yet am I sentient with a message in his name for all men who will to understand—I am the soul and spirit of Washington."

FACTORS WHICH INFLUENCE COAL PRICES

The Law Of Supply And Demand Does Not Justify Existing Mine Realization—Failure To Analyze Local Situations Is Responsible For Small Returns

By George H. Cushing

WITHIN the last month the coal industry has been brought face to face with one of those puzzling problems which occasionally embarrass all American business. That is, at times general business suffers what everybody refers to as a period of depression. Concerns which had remained solvent for years pass through the door leading to the bankruptcy court; other substantial concerns are forced to scratch gravel in an effort to keep alive. But when it is all over, a survey reveals that the volume of business has been steadily increasing. In the post mortem all business men inquire, puzzled:

"How can it happen that we did more business and still lost so much money? What happened to throw all of our calculations out of joint?" They know that something has happened to nullify the effect of the larger tonnage resulting from the better demand. It was never translated into better prices and profits. It is that very question which has bothered the bituminous coal industry for the last month.

What jarred the bituminous operators into a discussion of this interesting question was the tonnage report for 1924. It is now apparent that the industry started the year with between fifty-five and sixty million tons of coal in storage. It ended the year with a production of 467,700,000 tons. That means that, including the coal in storage and the coal produced, there was available to the people about 525,000,000 tons of bituminous coal. There was left in storage about 40,000,000 tons, indicating a consumption of about 485,000,000 tons. And 1924 was a year of bad business and of a presidential election.

On the contrary, in 1923—a fairly good business year—there was produced only about 445,000,000 tons, out of which at least 25,000,000 was put into storage and carried over into 1924. Thus, the actual consumption in 1923 was not much in excess of 425,000,000 tons.

The consumption, therefore, in 1924 was pretty close to 60,000,000 tons larger than it was in 1923. Even so, some coal companies made money in 1923 while nearly all of them were losing money and a great many of them were going into bankruptcy in 1924. These bituminous companies, therefore, increased their business and their losses at the same time. This means that the more business they did, the more money they lost. And that, in turn, means the prices weren't influenced by the law of supply and demand, but by something that was wholly outside that universal influence. The gripping question is, of course, as to what that extraordinary influence was.

If we make allowance for certain unavoidable inaccuracies in the total figures just quoted, and for the strength of oil competition with coal in the western territory, it is probably true that the increased consumption east of the Mississippi River amounted to about 50,000,000 tons of bituminous coal in 1924. If this business had been distributed evenly over the whole producing area east of the Mississippi River the union and nonunion mines alike would have been the beneficiaries. All of them would have shown, therefore, a pro rata increase in production.

The figures which became available in January do not indicate that any union district increased its output in 1924 over that in 1923. On the contrary, some of the larger union fields lost rather heavily—10 percent or more. Therefore, the total loss of business by the union districts was the actual decrease below the 1923 tonnage plus the increased tonnage reported for the eastern district as a whole. The total loss was considerable, everything being taken into account.

If all of this business went to the nonunion fields, they got what the union fields lost plus the tonnage which measured the increased consumption of the nation. The nonunion mines, therefore, must have done a much larger volume of business than ever before. That larger tonnage, if the law of supply and demand had operated, should have increased the prices which the nonunion mines charged. And, incidentally, as the nonunion prices increased their gain in tonnage should have fallen, because then the union mines should have been able to compete. When the nonunion prices failed to rise to the profit level it is evident that something besides the law of supply and demand was in operation.

It is obvious that the union fields lost—and knew they were going to lose—a considerable tonnage. In fact, such a loss was taken for granted the instant the union operators signed the Jacksonville agreement. That loss of tonnage meant, automatically and irrevocably, a loss of gross revenue. And unless they could cut expenses correspondingly that meant also a corresponding loss of net revenue. These union operators knew—or should have known—that so long as they were bound by the Jacksonville agreement they could not match penny for penny the prices charged by the nonunion districts. The nonunion operators had a higher cost of production. Therefore, they could not possibly charge exactly the same mine prices as did the nonunion operators and hope to come out with anything except a substantial monetary loss. Therefore, when the union mines began to cut prices to meet the nonunion competition they but added a loss of revenue per ton to the loss of tonnage itself. This compounded the loss and meant a further sacrifice of both gross and net revenue. It was, incidentally, this voluntary sacrifice which caused all of the trouble.

The big question which remains to be answered is whether that loss was unavoidable and whether the price cutting was, in all respects, justifiable. And a public discussion of that question is warranted by the fact stated at the beginning, namely, that this same difficulty appears very frequently in the affairs of other than coal companies.

To find the true situation we have to start with this assumption: The nonunion, immediately after the signing of the Jacksonville agreement, started out after the business of the union mines. They were going to get all of that business if they could. At least, that is the assumption when anyone gives voice to that broad old statement that "business is business." If the nonunion mines started out after all of the union business, and if they succeeded only in stopping the growth of the union tonnage and of taking away 5 or 10 percent, it must be assumed that the nonunion mines went just as far as they could go. That means that the union mines have, for some reason, a firm hold upon the 90 or 95 percent of their 1923 tonnage which they retained in 1924. And that probably means the union operators have a natural advantage in a part of their market which their competitors cannot readily overcome.

The instant you arrive at the conclusion that any operators have such control of any fraction of their market, that it is beyond the power of competitors to dislodge them, you run your head squarely against the stubborn fact that after all and for some unknown reason certain markets belong to certain producing districts—during good behavior, of course. That is equally true of almost any commodity, incidentally. It is an amazing fact; still it seems to be a fact.

At this point we get into rather an interesting (*Continued on page* 93)

WEST VIRGINIA'S LABOR PROBLEM

Ten Years Of Quiet, Peaceful Methods Have Borne Fruit, In Spite Of The Reports Of Violence That Have Been Broadcast—The Reaction Of The Men In the Cabin Creek District To This Propaganda Is Intensely Interesting And, As Explained In This Article, Shows The Value Of Peaceful, Educational Methods, Consistently Employed Over A Period Of Years

By JOSIAH KEELY *

TO work out plans for industrial cooperation it is desirable from time to time to review history and events leading up to given conditions. From the shooting which took place recently at Kayford, on Cabin Creek, W. Va., it might seem that no progress had been made since 1912, but the public may have the facts and judge for itself.

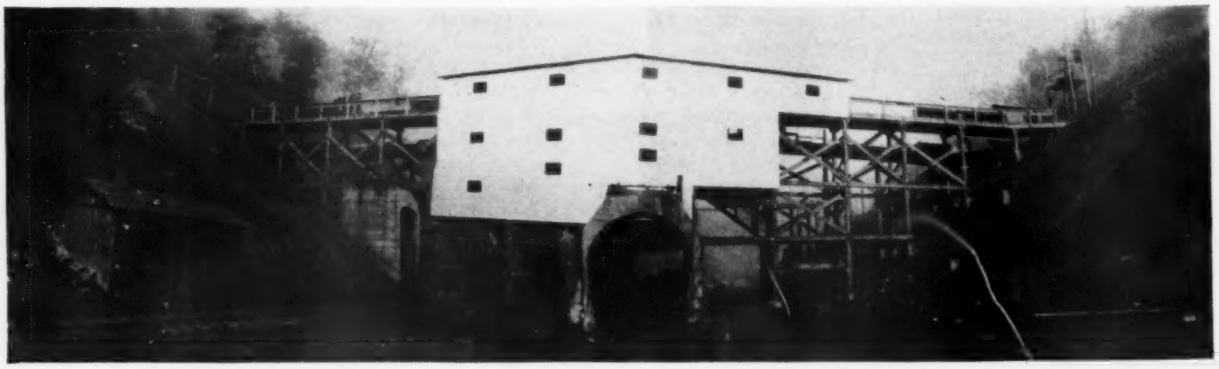
Raccoon mine is one of twenty owned and operated by the Cabin Creek Consolidated Coal Company and located at the head of the Ten Mile Fork of Cabin Creek. The conditions probably typically represent those of most of the mining camps of southern West Virginia.

Eleven or twelve years ago, following the labor troubles of 1912, when Cabin Creek became notoriously advertised as a region of bloody labor conflicts, the coal companies yielded to the pressure of the state and county authorities and signed up with the United Mine Workers of America. For ten years this relation continued, contracts being renewed from time to time in accordance with the policies of the United Mine Workers as dictated from Indianapolis.

During the war period existing contracts were disregarded and Cabin Creek, with the rest of the country, yielded to the demands for the various war-time advances in wages. Encouraged by the successes of these easily won victories, the mine workers of this district enlarged the scope of their activities to include dictatorial jurisdiction over every phase of the coal business. Strikes were called for everything, or nothing; and the district officials seemed to allow every local to interpret the contract as it pleased. It was everywhere evident that sovietism was the real objective. Moonshine stills were operated on Cabin Creek from every mountain rill, and in cold weather the mines were selected as a location for night parties of distillers. Hardly a month passed that some store was not robbed. Five murders were committed in Kayford in one year, and convictions were almost impossible. The maximum sentence did not exceed five years, and only part of that was served. The removal of an assistant boss was asked for at the Shamrock mine, and when it was not granted a trackman went home, dressed up to go away, and shot him down at the drift mouth. No one stopped him and, so far as I know, he is still at large. For years the brother of the murdered man followed him around, notifying the authorities from time to time as to his whereabouts, but so strong was the power of the union that he was never brought to trial. Union money was used to protect pistol-toters, and the union oath was used to protect union men in crime. As a climax to this condition the "Mingo march" was organized to bring Mingo and Logan Counties under the soviet control. From five to ten thousand men left their work without notice and spent days riding free on the trains, carrying pistols openly, and defying the law. All coal companies looked alike to the union men. Although they pretended to be preparing war against nonunion mines, in reality they were looting the stores and holding up the officials of union mines with which they had a contract and no grievance.

This brief summary brings us up to April 1, 1922, when the four states failed to agree on a contract. As West Virginia was an "outlying" district, it was supposed to wait until told what to do. The men all quit without notice and without making demands, telling us that they could not even discuss a contract with us without authority from Indianapolis. This is when many of the companies of southern West Virginia acceded to the requests of the miners themselves who had at last grown tired waiting and the mines were started up on the union scale, but without the union consent. No questions were asked as to whether a man belonged to a union or not. Those who still stayed out continued to occupy the company houses. There were few, if any, evictions. Suits for possession of the houses dragged on from month to month, from April to September, the average time for obtaining possession being about three months. When these finally left it was usually on compromise agreements in which judgments were given in exchange for an additional 30 days' possession. A small percentage of those who had taken months to leave went into tents on the nearest ground available, where they have been posing before the public for three years as evicted miners, thrown out on a three-day notice. There are about a hundred of these on Cabin Creek. They are supported by the United Mine Workers of America and encouraged to stay there. In fact, quite a number of n'er-do-wells who are not miners have from time to time moved in to take the

*General Manager, Cabin Creek Consolidated Coal Co., Chairman, West Virginia Industrial Cooperation Division, The American Mining Congress.



Raccoon No. 2 Tipple Receives Coal from Cars That Are Lowered Along 1,000-Foot Planes on Both Sides

place of those who could stand it no longer, and to give the Creek the appearance of being on a strike. These are the men who are interviewed and whose stories get into print in the interest of truth about West Virginia.

All through the rest of 1922 and through all of 1923 the union met with continued losses. Some companies worked under individual contracts with their men, but many of them simply went on working and conforming to the old contract. Most of them paid the same high scale of wages. Late in 1923 companies began shutting down for lack of business, or reducing to the 1917 scale of wages. By January 1, 1924, practically all mines in southern West Virginia that were working at all were on this scale. The Cabin Creek Consolidated on that date made with its men what is known as the "gentleman's agreement." It was a short individual contract in which the company engaged to continue paying the high scale until April 1 in exchange for a pledge that the miner, the rest of the year, would accept the prevailing scale of competitors and refrain from affiliating with any other organization interfering with the performance of his contract.

The Manhoist at the Top of the Plane Just After Discharging Its Load of Ten Men

From September, 1922, to November, 1924, may be considered the "golden age" on Cabin Creek, and, generally speaking, this period of real cooperation has not ended. There have been no strikes, no grievances, and no insincerities. Both operators and men concur in pronouncing it the most satisfactory period known on Cabin Creek and in the region generally. It is true that the companies made no money and the men did not always have steady work, but hundreds of automobiles were bought and paid for, movies were patronized, there were Sunday-school picnics, twilight league ball games, and a general era of good feeling. If the Cabin Creek Consolidated's action in paying the war-time wage for three months longer than most other companies can be considered as a voluntary bid for good will, it deserved three months more peace than the rest of the region. But on November 16, six weeks before the expiration of the "gentleman's agreement," ex-President Keeney, ex-Vice-President Blizzard and Organizer Saxon of Ohio appeared at Kayford and addressed the men. No guards have been employed since 1912, and no attempt was made to prevent the speaking, although their car was parked on the company property. The men were urged to stop working six days a week, join the Mine Workers, and divide up the work so that they could all get three days a week and each make as much money as before; which, taken literally, was equivalent to inviting the public to pay twice as much for coal. Next day about 25 Kayford men failed to appear for work. Most of them claimed various forms of disability, but some of them were frank enough to say that they had quit work and expected to remain in their houses until put out by law. No demands were made and no explanations offered.

During the next few days it was apparent that a secret campaign was on to shut the mines down. After a week it was no longer secret. The miners in tents were now to show the purpose for their long encampment by marching up and down the public roads from 6 miles down the creek, and mass meetings continued to be held. After each meeting and marching a few men quit work. The whole of their activities seemed centered on Kayford, the headquarters for the Cabin Creek Consolidated Coal Company's operations. No one was discharged for his activities and no strikebreakers were employed. When it was evident that a miner had quit he was served with a regular house notice, the return of which was put in line for suit for possession. No evictions were attempted nor threatened. No one was abused nor asked to go back to work. No one who came back was refused work.

After these things had been going on for two or three weeks and there were about a hundred men out, the men who had continued working held what was known as the "scab meeting" to try to stop the agitation by taking a vote as to whether they would remain loyal to their contract or join with the strikers. The vote was two to one to continue work. The company had nothing to do with instigating this meeting and until it was over presumed it was just another meeting of agitators. From this time on the progress of the strike seemed to be arrested, and more of the men who had quit began coming back. There were the usual rumors of threats used against the workers, but there were no arrests nor any violence.

As a sidelight on the situation, it is well to remark that in the days of the union, three years before, any dozen men with less agitation might have caused a complete strike over night, and the company was very much gratified at the determination of the men to adhere to their contract. Groups of nonunion miners went about arguing for working, and the paid leaders made a house-to-house canvass to induce men to strike. The management simply announced that as long as one man wished to work there would be work, and presented its new contract for 1925, which is similar to that of 1924, only guaranteeing the 1917 scale for the year and providing for any advance that might be given by its competitors by reason of better business. It was explained to the men who were working that it was important to sign this at once; first, that the company might know what to depend upon for the coming year, and, second, to show the strikers that contract breakers had no support. More than 90 percent of all the men at all the mines of the company signed this in one day. The result of this action spread quickly, and the effect was noticed at Kayford, where an increasing number of men reported for work.

In times past when the union was in power all labor disturbances in the camps reflected the tenseness of feeling by a falling off of attendance at church and Sunday school. The union has preferred a raw-meat diet. But all during these weeks of agitation it could not be checked this way. The children of both factions mingled freely, and only among the few active strikers was the rule enforced that a striker should not speak to a "scab." The Red Cross seals were carried around and sold to strikers as well as to the workers, if they had the money. Quite a number of the men who were not working announced that they would not join the union, but did not want to work with men running around fussing at them. It looked like the old days of bloody strikes were gone and that the men felt free to work or not, as they chose. Then it happened.

On the morning of December 16, which was the first day of the half month, about a dozen men who had not been working decided (*Continued on page* 95)

Concentrator of the Inspiration Consolidated Copper Co., Miami District, Arizona

Ransome—U. S. Geol. Survey photos
Sacramento Hill, Near Bisbee, Ariz.

METAL MINING IN THE UNITED STATES IN 1924

According To The Estimates Issued By The United States Geological Survey, Production Increased In The Copper Industry And In The Lead Industry—There Was A Material Falling Off In Gold And Silver Production, With Iron And Zinc Falling Below Normal—Development Work Is Quite Extensive And Many New Mills And Smelting Plants Have Been Completed

Alaska

The Production of Gold Increased but All Other Minerals Show Decided Decrease, With Exception of Lead, Petroleum, Marble, Etc., Which Show Slight Increases

MINES in Alaska produced $17,670,000 worth of minerals in 1924, as against $20,330,000 worth in 1923. The total value of the mineral output of Alaska since 1880 is $535,600,000. The source of this mineral wealth is approximately as follows:

Value Of Mineral Output Of Alaska In 1923-24

	1923	1924
Gold	$5,985,314	$6,350,000
Copper	12,630,335	10,000,000
Silver	668,012	450,000
Coal	755,469	550,000
Lead, petroleum, marble, gypsum, tin, platinum, etc.	291,513	320,000
	$20,330,643	$17,670,000

In spite of the gradual exhaustion of the richer gold placer deposits the gold output in 1924 was larger than in 1923. The increase was due mainly to activity at the lode mines in southeastern Alaska. The decrease in the total value of the mineral output of Alaska in 1924 from that in 1923 may be attributed almost entirely to the smaller production of copper and the much lower average price of that metal. The value of the coal produced was also somewhat smaller in 1924 than in 1923.

Gold Lodes

The gold miner still labors under the handicap of a fixed price for his product, although his operating costs have greatly increased.

In the Juneau district the Alaska Juneau mine increased its output considerably over that of 1923 and now produces the greater part of the lode gold of Alaska. Prospecting has been active throughout the Juneau district, and promising ore bodies have been disclosed on several properties between Funter Bay and Hawk Inlet. On Windham Bay a mill is being installed for the treatment of gold ores.

During the year there was an increase in mining activity on Chichagof Island. The Chicagof and Hirst-Chicagof gold mines continued production, and a mill was placed in operation at the Apex-El Nido mine. Prospecting was thus stimulated throughout the district, and interest was maintained in a number of nickel properties.

In the Copper River Basin, on Prince William Sound, and on Kenai Peninsula there were no considerable developments in gold lode mining, although a few small mines continued production. Further discoveries of gold quartz lodes at Nuka Bay, on the south shore of Kenai Peninsula, indicate that this may be the center of a large area of mineralization. One mill was to be installed in 1924, and several veins are said to be promising. In the Willow Creek district five mines yielded about the normal output of gold.

Somewhat less lode gold was produced in the Fairbanks district in 1924 than in 1923. The principal producer was the Mohawk mine.

In the Kuskokwim district the Whelan mine, formerly operated as the Nixon mines by the Treadwell Yukon Company, produced considerable gold in 1924. Development work was continued on many other lodes in the Yukon Basin, including a bismuth-bearing auriferous lode.

In 1924, 20 quartz mines in Alaska produced $2,750,000 in gold, an increase of more than $400,000 over the output for 1923. This increase is largely credited to the Alaska-Juneau mine. The silver and lead produced in Alaska were almost entirely by-products of gold and copper mining. The silver produced in 1924 was valued at about $450,000.

Gold Placers

In 1924 the rainfall was generally normal, and the total output of placer gold was greater by more than $275,000 than in 1923, although the output from dredges showed a decrease.

Twenty-five dredges were in operation in Alaska in 1924 and produced $1,565,000 worth of gold, as compared with 24 dredges in 1923 that produced $1,848,000. Of these dredges 15 were in Seward Peninsula, 3 in the Fairbanks district, 2 each in the Innoko and Iditarod districts, and 1 each in the Kuskokwim, Circle and Yentna districts.

The palladium and platinum mine in the Ketchikan district was operated for a part of the year. Some platinum was also obtained as a by-product of gold-placer mining. A few tons of stream tin was mined in the Port Clarence district, and some was recovered as a by-

product of gold mining in the Hot Springs district.

Copper

The production of this metal showed a large decrease from that in 1923. In 1924 Alaska produced 75,500,000 pounds of copper, valued at about $9,800,000, as compared with nearly 86,000,000 pounds in 1923, valued at $12,630,000. In 1924, as in other years, the output of copper was largely made by the mines of the Kennecott Copper Corporation in the Chitina Valley and on Latouche Island, though some copper was produced by other mines in Chitina Valley and in southeastern Alaska.

Coal

In 1924 Alaska produced about 90,000 tons of coal from 10 mines, as compared with 119,826 tons from 12 mines in 1923. A very large part of the total output came from the Evan Jones mine, in the Matanuska field, which produces bituminous coal, and from the mine of the Healy River Coal Corporation in the Nenana field, which produces good lignite.

Some exploratory work was done on the high-grade coal of the Matanuska and Bering River fields, though not much of this coal was marketed.

Very little prospecting has been done on the anthracite beds, and whether they include workable bodies of coal can be proved only by extensive exploration, both on the surface and underground.

Petroleum

In 1924, as in the past, all the petroleum produced in Alaska was obtained from a dozen small wells in the Katalla field, on the only patented tract of oil land in the Territory. These wells and a small refinery are operated by the Chilkat Oil Company, which sells its gasoline and distillate in the local market.

Interest in the exploration of promising oil fields in Alaska continues. Both the Standard Oil Company and the Associated Oil Company have carried on drilling operations under great difficulty and expense but with more or less promise of satisfactory results.

Arizona

Output of Copper Substantially Increased, with Production of Gold and Silver Showing Material Reduction. Considerable Progress Made in Construction and Operation of New Mills and Smelting Plants

THE value of the gold, silver, copper and lead produced by mines in Arizona in 1924 was $98,216,000, a decrease from $104,301,200 in 1923. Though great progress was made in the construction and operation of new mills and a new smelting plant, the decrease in the price of copper and silver and a decrease in the quantity of gold mined materially lessened the value of the output.

Hydraulic Mining, Glacier Creek, Nome, Alaska

Copper

The output of copper increased from 618,928,602 pounds in 1923 to 676,000,000 pounds in 1924, but the value decreased from $90,982,504 to nearly $87,744,800. Nine smelting plants were active throughout the year, and the plant at Humboldt was operated for two months. The output of several of the smelting plants was much less than in 1923, but the plant at Morenci increased its output considerably, the Calumet & Arizona smelter was improved to take care of the concentrate from the New Cornelia mill, and the new Magma smelter began operations in April. The largest producers of copper in 1924 were the United Verde, Inspiration, Copper Queen, Ray Consolidated, New Cornelia, Miami, United Verde Extension, Morenci, Calumet & Arizona, Old Dominion, and Magma mines. Other mines that produced more than 1,000,000 pounds of copper each were the Arizona Commercial, Iron Cap, Shattuck, Midland, Arizona Binghampton, Superior & Boston, and Night Hawk mines. An unusual amount of construction and repair work was done in 1924. A 5,000-ton flotation plant was completed and operated by the New Cornelia Company, the No. 6 concentration plant for the Morenci mines was completely remodeled and the new Copper Queen concentrator was in full operation. The Inspiration Company began the construction of a large leaching plant and the United Verde Copper Company completed a new crushing plant and made tests for concentrating and leaching low-grade ore.

Lead

The production of lead increased from 16,291,548 pounds in 1923 to 17,800,000 pounds in 1924, and the value increased from $1,140,408 to $1,432,900. The copper Queen mine, at Bisbee, was the largest producer of lead, and the Shattuck mine, which was operated throughout the year, was second. The shipments of lead ore from the Calumet & Arizona property were greatly increased, and much silver-lead concentrate was shipped from the Signal mine, in Mojave County. The mines at Tombstone produced less lead, but shipments from Santa Cruz County were stimulated by the high price of lead.

Zinc ore was shipped from the Copper Queen mine in 1923, but no zinc products were shipped from Arizona mines in 1924.

The dividends paid in 1924 by mining companies in Arizona (United Verde Extension, United Verde, Miami, New Cornelia, Calumet & Arizona, Inspiration, United Eastern, and Arizona Commercial) amounted to $9,969,155, exclusive of $2,000,000 paid by the Phelps Dodge Corporation.

Gold

The output of gold decreased from $6,121,121 in 1923 to $4,840,500 in 1924 as a result of an unusually large decrease in the production of gold ore in Mohave County and copper ore in Yavapai County. The United Eastern Mining Company, at Oatman, ceased operations on company account June 1, and though the Tom Reed, Gold Road, and Telluride properties produced much gold, the output of the San Francisco district decreased from $2,796,830 in 1923 to about $1,552,500 in 1924. The largest output of gold in Arizona was made by the United Verde mine, at

Jerome, though the output was far less than in 1923. Increased production of gold was made at the Magma, New Cornelia (sulphide ore), Copper Queen, Shattuck, and Morenci mines. Other than the United Verde mine the largest producers of gold were the Gold Road, Calumet & Arizona, United Eastern, Copper Queen, Tom Reed, New Cornelia, United Verde Extension, Telluride, and Magma mines. The new cyanidation plant of the Telluride Mining Company at Oatman was completed and put in operation in April.

Silver

The output of silver decreased from 7,343,742 ounces in 1923 to about 6,270,000 ounces in 1924, and the value decreased from $6,021,868 to $4,197,800. Increases in the output of silver from the Magma copper ore and New Cornelia copper concentrate were offset by decreases in the output of the United Verde, Copper Queen, Bunker Hill, and Signal mines. The largest producers of silver were the United Verde, Copper Queen, Calumet & Arizona, Magma, Shattuck, United Verde Extension, Superior & Boston, Bunker Hill, Signal, New Cornelia, and Old Dominion mines. The Stargo, Copper Chief, and Iron King mines were idle.

California

All Minerals Produced in California Show Increase in Value But Production Decreased in Gold and Silver. Copper and Lead Production Increased.

THE value of the gold, silver, copper, lead, and zinc produced in 1924, amounted to $22,639,000, an increase of $1,510,000 over the value for 1923. The increase is due entirely to the much greater production of copper, for the output of every other metal was less than in 1923.

The gold produced in 1924 is estimated at 627,660 ounces, valued at $12,973,000, as compared with 647,210 ounces, valued at $13,379,013 in 1923. The production of gold by dredges apparently declined about 25 percent as compared with 1923, when five more dredges were in operation than in 1924. Other forms of placer mining were also less productive than usual because of the severe drought in 1924. The deep mines, on the other hand, increased their output of gold, particularly the mines in Amador, Nevada, and Sierra counties.

The silver produced in 1924 is estimated at 3,338.000 fine ounces, valued at $2,225,000, compared with 3,559,443 ounces, valued at $2,918,743, in 1923. The decrease would have been larger but for the great increase in the mining of copper ore, which yields also some silver, for the output of silver ore at the California Rand was restricted for a time and the lead mines, which also produce silver, were not nearly so active as in 1923.

The copper mines of the State, which were particularly active in 1924, produced 53,330,000 pounds of copper, valued at $6,880,000 as compared with 28,317,759 pounds, valued at $4,162,711, in 1923. The great increase was due largely to the Mammoth and Calaveras Copper companies, both of which were operated through the whole of 1924 after beginning production late in 1923. The Walker mine increased its output considerably, but the Engels mine was working at a slightly reduced rate during part of the year on account of development work. Copper was produced late in 1924 at the Bully Hill mines, which were reopened by the California Zinc Co., primarily as a source of zinc oxide.

The production of lead in 1924 is estimated at 5,160,000 pounds, valued at $412,000, as compared with 9,549,680 pounds, valued at $668,478, in 1923. All the lead mines, which are in the southern part of the State, were working on short power, due to the severe drought. The output of the Tecopa and Darwin mines was much less than in 1923 and the Slate Range did not operate at all, but the Estelle, Cerro Gordo and Santa Rosa increased operations and a few smaller operators entered the field.

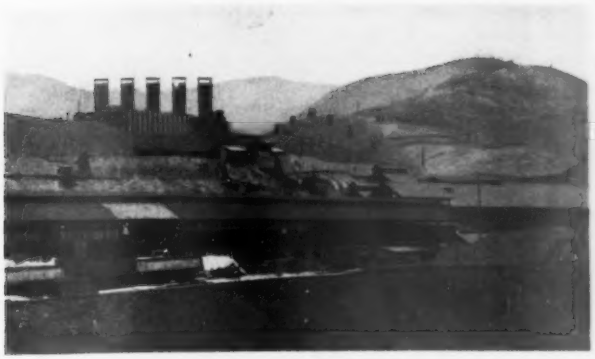
California again became a producer of zinc late in 1924 with the reopening of the Bully Hill mines at Winthrop, Shasta County. The mines were reopened in October and smelting was begun in November. The zinc is recovered as zinc oxide and leaded zinc oxide for use as pigments. The zinc content of ore mined in 1924 is estimated at 2,380,000 pounds, valued at $149,000. No zinc was produced in California in 1923.

Output Made By Counties And Districts

In Siskiyou County lack of water prevented much hydraulic work, but small placer miners and pocket hunters were active on both Klamath and Salmon rivers. The Buzzard Hill, Independence, and Advance (or Victory) quartz mines were productive. At the first two properties mills have been installed, and a 17-mile transmission line was completed to the Advance. The four dredges in Trinity County were producing. Low water allowed only short runs at the Lorenz, Red Hill, Nuggett Bar, Paulsen, Union Hill, Steiners Flat, and Big Bar hydraulic mines. The numerous small placer miners were not notably successful. The quartz mines in Trinity County were not active. In Shasta County very little placer work was done by the two Gardella dredges on Clear Creek, near Redding, one of which was destroyed by fire near the end of November. Several small quartz mines at French Gulch were operated, and the Reid mine, at Old Diggings, was reopened, supplying fluxing ore to the Mammoth and Bully Hill smelters. The Mammoth smelter, at Kennett, was in operation throughout the year, and smelted much copper ore from the Keystone, Balakala, and Mammoth mines. The Mountain Copper Co. operated its Hornet pyrite mine, but its copper properties and smelter remained closed. The reopening of the Bully Hill mine and zinc oxide plant, at Winthrop, in November and the acquisition of the Afterthought copper-zinc mine, at Ingot, by the same interests were of particular importance to Shasta County and the State.

In Butte County the principal output was that made by the four gold dredges, one near Chico, and the others in the Oroville field. Some work was done in old channels near Magalia and De Sabla placer operations were resumed at Cherokee. The Engels and Walker copper mines, in Plumas County, were large producers. Near Forest and Allegheny, Sierra County, there was much activity and a number of quartz and drift mines were under development. Several properties were productive, notably the Sixteen to One, Oriental, Plumbago, and Kate Hardy. At Downieville a number of quartz and drift mines were working, and near Sierra City the Young America, Bigelow, and Monarch were reopened, as well as several placers. Hydraulic mines near Scales, Port Wine, and Poverty Hill had water for only short runs early in the spring, and very little placer work was possible at Brandy City. In Nevada County the chief interest, as usual, was centered at Grass Valley. Several of the smaller mines that were under development in 1923 were producers in 1924. The North Star had a good year. The Empire enlarged its territory. The Idaho-Maryland bonded the Brunswick property.

In the Mother Lode counties the principal producers were the Plymouth, Central, Eureka, Argonaut, Kennedy, and Moore mines, in Amador County; the Carson Hill, in Calaveras County; the Original, in Mariposa County; and the Shamut, in Tuolumne County. In Placer County the Big Oak and Rising Sun Quartz mines, near Colfax, were reopened. In Eldorado County the Hines-Gilbert, at Spanish Dry Diggings, was the largest operator. In Amador County sinking was in progress at the Plymouth, Argonaut, and Kennedy. The Central Eureka acquired additional ground by purchasing the "Hetty Green" mine, and the company is reported to have opened high-grade milling ore. The Marklee quartz mine, at Volcano, was reopened to the 500-foot level. In Calaveras County the Carson Hill and Melones mines were active. The Calaveras Copper Co. was



Kennett Copper Smelter of the United States Smelting, Refining and Mining Co. at Kennett, Calif.

Stern View of Yuba No. 16 Gold Dredge Operating in the Yuba District, California

producing all the year. In Tuolumne County the Eagle-Shawmut continued operations on a considerable scale; the App mine and the Harriman, near Jamestown, were producers; and the Clio-Vindicator, at Tuttletown, after installing a new cyanide plant, continued production. Several quartz properties near Big Oak Flat, Confidence, and Stevens Bar were under development. The Original mine at Clearinghouse, Mariposa County, continued production. The Princeton, at Bagby, was under development and some ore was milled. The development of the Little Wonder, at Jerseydale, was continued.

In Mono County some ore was produced from the Masonic mine. The Bodie mine was very quiet, and development was continued by the Mono Mines Co. in the Patterson district. In the Blind Springs Hill district, not far from Benton, work was continued by the Camanche Milling and Reduction Co. and a little silver ore was shipped. In Inyo County and Tecopa, Estelle, Santa Rosa, Darwin lead-silver, and Cerro Gordo properties were productive, and several smaller ones shipped lead ore to smelters at Salt Lake City. The chief producing mine in San Bernardino County was the California Rand Silver, Inc., near which there was less development than during 1923. Exploration work in the Calico district was under way on a consolidation of several properties. At Soledad Peak, near Mojave, there was some activity, and the Zenda mine, in the Loraine district, near Caliente, continued operation of its cyanide plant. The Blue Light Mines Co., in Silverado Canyon, Orange County, was under development, and several small properties in the Cuyamaca and Descanso districts, San Diego County, were operated. Lead-silver ore was shipped from Santa Catalina Island. Some prospecting was under way near Mecca, in Riverside County.

Colorado

Gold Production Shows Substantial Increase, with Lead and Zinc Production Considerably Greater Than 1923. *Copper and Silver Both Show Falling Off in Production. Total Value of All Metals Show Slight Increase Over* 1923 *Figures, Which Were* 21 *Percent Higher Than* 1922

DURING the year 1924 the metal mines of Colorado produced $8,494,000 in gold, 3,248,000 ounces of silver, 46,022,000 pounds of lead, 2,849,000 pounds of copper, and 59,205,000 pounds of zinc, as compared with $6,591,629 in gold, 5,334,488 ounces of silver, 45,698,185 pounds of lead, 4,248,109 pounds of copper, and 54,152,000 pounds of zinc in 1923. These figures show increases of nearly $2,000,000 for gold, $483,000 for lead, $47,000 for zinc, but decreases of $2,200,000 for silver and $254,000 for copper. The total calculated value of the five metals was $18,449,000, as compared with $18,471,590 in 1923, which is virtually no change, following an increase of 21 percent in 1923 over 1922.

At the end of 1924 the gold-mining district of Gilpin County, after 64 years of continuous production, is greatly reduced in population, although several mines and mills there are still in operation. In Clear Creek County, adjoining Gilpin County, considerable development work was done in 1924. New bodies of silver ore were opened on a western extension of the Silver Plume-Georgetown district, and promising new discoveries were made near Idaho Springs, Dumont, and Lawson. Owing to a series of legal difficulties Boulder County has not maintained its production, but development work already begun promises an increased output in 1925. The Wood Mountain mine, at Sugar Loaf, has in some years produced more gold than in 1924. A new lessee of the Boulder County tunnel, at Cardinal, proposes to drive it several hundred feet northward in the hope of cutting veins that show on the surface and plans to retimber and reopen the vein cut at a depth of 3,200 feet and there drifted upon 1,800 feet west and 650 feet east. The Caribou district has been rather inactive, but during the last few years has annually produced about 50,000 ounces of silver. Park County has made its output of gold principally by dredging the flood plain of the South Fork of the South Platte below the early gold-placer town of Fairplay and by the shipment of gold ores from the London mine, on Mosquito Pass, between Alma and Leadville. Across Hoosier Pass, in Summit County, some gold has been recovered at the Bemrose placer, at the head of Blue River; and at Breckenridge, on the Blue River, two dredges have continued work within sight of the town. On French Gulch the Wellington zinc mine and mill were operated only until June, when a rise in the rates charged for electric power caused the managers to close the mill and to confine their operations to the shipments of lead oxide ores and the development of zinc sulphide ores. At Tiger development continued at the Royal Tiger mines, and some concentrates were produced at the new mill there. Some hydraulic mining was done on high bars on Swan River. The production at Montezuma was not heavy, but money has been obtained for extensive development work. At Kokomo very little work was done, owing to the settlement of estates and other legal difficulties, but in August the Climax Molybdenum mine, at the head of Tenmile Creek, in Lake County, idle since 1918, was reopened and the mill was set in motion at half capacity.

Lake County (Leadville) produced $998,000 in gold, as compared with $271,504 in 1923, but suffered a loss in its production of silver, owing to the closing of the Downtown mines in August, 1923,

and the reduction of operations at the Yak tunnel. The Western Zinc Oxide plant continued to furnish a home market for zinc carbonate ores. The shipments of zinc sulphide ore have not been heavy, but the task of unwatering the Carbonate - Hill - Graham Park mines, which have been filled with water since 1919, will probably be completed early in 1925, reopening to mining several hundred thousand tons of lead-zinc ore bodies. The mill in the Leadville district has continued to treat low-grade gold-silver siliceous ores from the Ibex mine, which has again given new hope to the district by producing some $15,000 in specimen gold and by sending much high-grade gold on to the smelter. Iron-manganese ores containing 35 to 40 percent of manganese have been shipped out of the state, and ores containing 10 to 35 percent of manganese have been purchased by the Colorado Fuel and Iron Company, at Pueblo. The Arkansas Valley lead-bullion smelter has recently "blown in" a fourth furnace, though its work has thus far been confined to the treatment daily of some 200 tons of old smelter slags.

At Gilman, Eagle County, the Empire Zinc Company continued to ship zinc sulphide ore in considerable quantity to its magnetic separation mill and zinc oxide smelter at Canon City and to ship pyritic silver ores to Salt Lake City smelters for use as flux.

The idleness of the Smuggler mill at Aspen reduced the output of lead and silver from Pitkin County, but silver ore and some lead-zinc ore were shipped from that county. At Whitepine, Gunnison County, lead-zinc ore in considerable quantity has been shipped throughout the year, and the Carter amalgamation mill, at Ohio City, was operated part of the year. In Saguache County, at Bonanza, owing to a series of difficulties, the Rawley mine, with much ore developed, has been idle, but other developing properties have shipped some lead-silver ores. The iron mine at Orient has shipped steadily to the steel plant at Pueblo. In Chaffee County shipments of lead-silver ore have been made from the Monarch-Garfield district. At Lake City, Hinsdale County, there has been more than the usual development work and some shipments of silver ore of good grade have been made. Mineral County (Creede) has continued to ship silver siliceous ores and fluorspar.

The production in Ouray County has been reduced by the idleness of the Atlas mines during the last half of the year. No work was done at the famous Camp Bird mine, and the Mountain Top mine was likewise idle. The Wanakah pyritic gold-silver mine was reopened, with the mill, and a new semi-pyritic smelter was built and put into operation.

The mills in San Miguel County continued to ship lead-silver-gold concentrates to the Durango smelter and silver-gold bullion to the Denver Mint. The Alta mines were operated intermittently. The Smuggler-Union management reports that at least three months' supply of ore has always been in sight throughout the year, and the Tomboy Gold Mines Company, Ltd., in its report for the fiscal year ending July 1, 1924, stated that a profit of $75,500 had been made and a dividend declared. Up to April the Black Bear mine shipped a large quantity of complex ore to the Smuggler-Union mill, where high-grade lead concentrates were made on the concentration tables and the overflow was sent to the flotation machines to make a lead-zinc-copper-iron sulphide concentrate. This concentrate was sent to the Reed-Coolbaugh sulphating plant at the Durango smelter in quantity sufficient to keep the sulphating plant in operation through August, when zinc-lead ores were received from other districts. A new flotation mill was set in motion on November 1 at the Carbonero mine, at Ophir, and has continued to the sulphide ore mined below the oxidized zone.

San Juan County regained its place as a large producer of metals, gradually increasing the treatment of lead-zinc-silver-gold-copper ore at the Sunnyside mill to 20,000 tons a month. This 600 to 700-ton daily flotation mill made a large quantity of high-grade zinc concentrates and high-grade lead concentrates. The resumption of operations at the Pride of West and Aspen mines added to the production, and the Mountain Queen became a producer.

Mines in La Plata County shipped nearly twice as much gold ore as in 1923. Some development work was done in districts on the line between Conejos County and Rio Grande County.

In the old mining districts of Custer County the mining and milling of the cerusite ores of the Terrible mine were continued and a relatively large quantity of high-grade lead concentrate was produced. The old dump at the Bassick mine, at Rosita, was retreated by cyanidation, and shipments of silver-lead-copper ore was made from the Passiflora mine, at Westcliffe.

Teller County (Cripple Creek) produced $4,888,000, as compared with $4,047,000 in 1923. The Cresson mine was a steady shipper of gold ore amounting to 10,000 to 11,000 tons a month valued at $15 to $19 a ton, but in one quarter of the year its production fell in average content owing to the shipment of ore of lower grade, taken out in development in connection with the sinking of the shaft from 1,700 to 2,000 feet. This mine is equipped with a new hoisting plant capable of hoisting from a depth of 3,000 feet. The company's work and that of lessees on the property of the United Gold Mines Company resulted in shipments of 8,000 to 9,000 tons a month, furnishing an increase in ore at the Golden Cycle Mill at Colorado Springs, where all the ore from the Cripple Creek district worth above $8 a ton (some even less) is treated. The Portland Gold Mining Company continued to operate its Independence non-roast concentration-cyanide mill at Victor.

The rich ores taken from the 2,600-2,750-foot levels of the Portland mine was sufficient to pay off the company's indebtedness, to permit the purchase of additional supplies, and to sink the shaft to a depth of 3,000 feet. The long idle American Eagles shaft was reopened, repaired, and sunk 500 feet deeper—from 1,500 feet to 2,000 feet. Lessees found ore in the Anaconda tunnel of the Mary McKinney mine, in the Forest Queen, and in the Sangre de Cristo tunnel.

Smelting

A review of the condition of the smelting industry in Colorado in 1924 shows that the plants in operation were the lead smelters at Durango and Leadville, the zinc oxide plants at Canon City, Leadville, and Pueblo, and the leaded zinc-oxide-copper matte plant at Florence. Some pyritic gold-silver ore and concentrates were received from Clear Creek and Gilpin Counties at the dismantled Globe smelter, where flue chambers are now used for collecting arsenious oxide, thallium, and cadmium.

Idaho

Lead and Silver Production Advances—Gold, Copper and Zinc Show Decrease

THE value of the gold, silver, copper, lead, and zinc produced from ore mined in Idaho in 1924 was about $27,910,450, as compared with $26,510,524 in 1923. Many of the large mines were producing at an increased rate. The production of lead and silver increased materially, but that of gold, copper, and zinc was less than in 1923.

Lead

The output of lead increased from 242,355,733 pounds in 1923 to 256,500,000 pounds in 1924. The value increased from $16,964,901 to $20,648,250, as the price of lead in 1924 rose from 7 cents to 8.05 cents a pound. The Bunker Hill & Sullivan mine was the largest producer of lead in the state, and the Morning mine, near Mullan, was second. These were followed by the Hecla, Hercules, Tamarack & Custer, Gold Hunter, Idaho Continental, Latest Out, Success, and Mace mines, each producing more

U. S. Bureau of Mines
East Butte and Pittsmont Smelter, Anaconda Copper Co., Butte, Mont.

Irving, U. S. Geol. Survey
View of Leadville, Colo.

than 1,000,000 pounds. Production was resumed at the Wilbert mine, in Butte County, and the Red Bird mine, in Bayhorse district, Custer County, was under investigation by representatives of the Ford Motor Co. The Coeur d'Alene district alone produced about 242,000,000 pounds of lead. Lead ore was smelted continuous at Bradley, Idaho, two lead furnaces being operated after ore and concentrate from the Hecla mine began to be received regularly. The Hercules mine, at Burke, long a large producer, was said to be mined out by the end of the year, but the Hercules Mining Co. has made good progress in opening new ore at the Hecla, Ajax, Stratton, Sunshine, Idaho Continental, and Amy Matchless mines.

The recoverable zinc in the ore mined decreased from 27,952,749 pounds in 1923 to 16,000,000 pounds in 1924, and the value from $1,900,787 to $1,009,600. Unfortunately the Callahan Zinc-Lead Co., the largest zinc producer in Idaho in recent years, made no shipments in 1924 but continued development work. Zinc concentrate was shipped to the electrolytic zinc plant at Great Falls, Mont., from the Morning, Success, Nabob, and Constitution mines, the Morning mine being the largest producer. The Nabob mill, in Pine Creek, remodeled and operated in March, was burned in a forest fire in July. The prospects are good at the Star mine, which was being developed through the large crosscut from the Hecla mine.

Dividends amounting to $4,638,500 were paid by the Bunker Hill, Hecla, Federal, Hercules, and Tamarack & Custer mining companies.

Silver

The output of silver increased from 7,673,662 ounces in 1923 to about 8,048,000 ounces in 1924, but the value decreased from $6,292,403 to $5,388,100. The operators of the large silver-lead mines, including the Hecla, Hercules, and Tamarack & Custer properties, were again active. The output of silver from the Morning, Hecla, and Gold Hunter mines was greatly increased, though the Callahan mine was idle and the output from the Talache, Ramshorn, and Independence mines was much less. In the Coeur d'Alene district, which produced about 6,600,000 ounces of silver, or 82 percent of the total for the state, the largest producers were the Morning, Bunker Hill & Sullivan, Hecla, Hercules, Tamarack & Custer, Gold Hunter, Caledonia, and Success mines. In other districts of the state the Talache, Ramshorn, Idaho Continental, and Independence mines supplied much silver. Rich ore was said to have been opened at the Talache mine, in Bonner County, and a new mill was operated at Lakeview by the Hewer Mining Co. late in the year.

Copper

The output of copper decreased from 3,979,631 pounds in 1923 to 2,430,000 pounds in 1924, and the value decreased from $585,006 to $315,400. The Idaho Metals Co., at Murray, was the largest producer of copper. Its products were first-class shipping ore and concentrates. In Lemhi County the copper production decreased, as shipments of concentrate from the Pope Shenon mine were stopped in May. Copper was also saved in the smelting of ore from the Talache mine and from several lead mines in Shoshone County.

Gold

The mine output of gold was valued at $549,100, as compared with $767,427 in 1923. Though the output from dredging represented a large part of the total output of gold, it was much less than in 1923. The production of gold from deep mines increased slightly, especially from the Gold Hill & Iowa property at Quartzburg and the Unity mine in Idaho County. The largest producers of gold in 1924 were the South Park Dredging Co., at Featherville; the Yukon Gold Co., at Murray; the Gold Hill & Iowa, at Quartzburg; the Idaho Metals Co., at Mackay; the Unity mine, near Warren, and the Talache property in Bonner County.

Montana

Gold Production Decidedly on the Upgrade, Lead Showed Increase, with Silver Remaining About the Same as 1923, and Zinc Production Decreasing. Copper Production Advanced Considerably, and Lead Also Shows Increase

THE value of the gold, silver, copper, lead, and zinc produced was $54,228,700, a decrease from $57,812,970 in 1923. A large increase was made in the production of copper and gold. The production of silver was nearly the same as in 1923, that of lead was slightly greater, but that of zinc was considerably less.

Gold

The value of the output of gold increased from $1,758,748 in 1923 to $2,006,800 in 1924. The spectacular feature of the year was the large production of gold and silver by the Jib Mining Co., operating near Basin, Jefferson County. The new 300-ton flotation mill there began work in February and made a larger output of gold during the year than any other mine in Montana. The Anaconda Copper Mining Co. was second, and the Jardine and Drumlummon mines followed. The general increase in the output of gold was rather surprising, as

the Shannon, Ruby Gulch, and Swissmont properties, which were large producers in 1923, were closed. Encouraging reports came from the August mine, near Landusky, Phillips County, and from the old Drumlummon mine, at Marysville, where cyanidation mills were again operated. At Butte considerable gold was produced from the Anaconda, Goldsmith, Butte West Side, Butte & Superior, Elm Orlu, Moulton, and Poser mines.

Copper

The output of copper increased from 224,125,264 pounds in 1923 to 250,182,000 pounds in 1924, but the value of the output decreased slightly, from $32,946,414 to $32,473,600. The Anaconda Copper Mining Co. was producing copper at an average rate of 20,000,000 pounds a month at the smelting plant at Anaconda. Though some of the mines at Butte were closed, much development work was done, especially in deepening shafts. The smelter of the East Butte Copper Mining Co. at Pittsmont was closed in July after it was found that the ore of the Colorado mine would be shipped to Anaconda. The largest copper producers were the Anaconda, Butte & Superior, East Butte, Colorado, Silver Dyke, Anselmo, and Jib mines.

Lead

The production of lead increased from 35,945,623 pounds, valued at $2,516,194, in 1923 to 37,712,000 pounds, valued at $3,035,800, in 1924. Besides the lead produced from zinc ore and lead-zinc ore mined at Butte from the Butte & Superior, Elm Orlu, Anaconda, Anselmo, Moulton, Butte Copper & Zinc, and Poser mines, much lead was produced from the Silver Dyke mine, near Neihart, the Block P mine in Judith Basin County, the Hecla slag dump in Beaverhead County, and the Snow Storm, Jib, Sterling, and Angelica mines. The lead smelting plant at East Helena was unusually active treating ore and residues from Montana as well as lead concentrate from Idaho.

Zinc

The output of recoverable zinc in Montana decreased from 141,460,392 pounds in 1923 to about 123,000,000 pounds in 1924. The value decreased from $9,619,307 to $7,761,300. The electrolytic zinc plant near Great Falls is expanding as a custom plant and has treated zinc concentrate shipped from Montana, Idaho, Utah, and Nevada. At Butte the largest producers of zinc were the Butte & Superior, Elm Orlu, Anaconda, Anselmo, Emma, Moulton, and Poser mines. Both the copper ore and zinc ore of the Butte & Superior mine were concentrated at Anaconda, the mill at Butte being idle. Ore from the Elm Orlu and other mines was separated into lead and zinc products at the Timber Butte mill south of Butte.

The Anaconda Copper Mining Co. paid $2,250,000 in dividends in January, but passed the other quarterly payments.

Silver

The mine output of silver decreased slightly, from 13,380,862 ounces in 1923 to 13,370,000 ounces in 1924, and the value decreased from $10,972,307 to $8,951,200. Most of the silver was mined by the Anaconda Copper Mining Co. A decrease in the output of silver from the East Butte, North Butte, Elm Orlu, Champion, and Philipsburg mines was balanced by an increase in that from the Anaconda, Butte & Superior, Jib, Anselmo, Silver Dyke, and Butte West Side mines. The property of the Davis Daly Copper Co., including the Colorado and Hibernia mines, was sold to the Anaconda Copper Mining Co. in March. The largest producers of silver in 1924 were the Anaconda, Butte & Superior, Elm Orlu, Silver Dyke, Anselmo, Goldsmith, Jib, Butte West Side, Moulton, Poser, East Butte, and Block P mines.

Nevada

Unusual Activity in Various Camps, with Increased Production in Gold, Copper and Lead. Silver and Zinc Production Decreased

THE value of the gold, silver, copper, lead, and zinc decreased from $25,040,349 in 1923 to about $23,800,000 in 1924. The production of copper and gold increased considerably in 1924 and that of lead slightly, but the production of silver and zinc decreased. Though the average price of silver, copper, and zinc were less than in 1923, there was no general abatement in activity at the principal mining camps. In fact, the mines of Tonopah, Ely, Jarbidge, and the Comstock region were unusually busy.

Gold

The output of gold increased from $4,223,109 in 1923 to $4,700,000 in 1924 on account of an unusually large increase in the production of the United Comstock, Nevada Consolidated, Tonopah Extension, and Elkoro properties. The United Comstock Mining Co. (succeeded by the Comstock Merger Mining Co.) treated gold-silver ore at Gold Hill and was again the leading producer of gold in the state. The Nevada Consolidated mine, at Ely, was second, because of an increase in the smelting of copper ore, and the Tonopah Extension and Elkoro properties followed, with marked increases. Other large producers of gold were the Tonopah Belmont, Round Mountain, West End, Tonopah Mining, Flowery Comstock, Goldfield Consolidated, and Rochester Silver mines. The mines in the Tonopah district produced more gold than those in any other district in the state, but their output was only slightly more than in 1923, and was closely followed by that of the Comstock district. Ore shipped by lessees increased the gold output of the Goldfield district. The mill at the Bluster property, at Jarbidge, turned out considerable gold-silver bullion from June to December, but the gold output of the White Caps mine, at Manhattan, was decidedly less. The output of gold from Storey County (Comstock district) increased from $956,818 to $1,110,000 and that from the Jarbidge district from $341,400 to $571,900.

Copper

The output of copper increased from 67,204,282 pounds in 1923 to about 80,400,000 pounds in 1924, and the value from $9,879,029 to $10,455,000. The Nevada Consolidated Copper Co., at Ely, greatly increased its output and produced copper at an average rate of about 5,800,000 pounds a month after rebuilding its concentration plant. Much copper ore was also shipped to the mill and smelter at McGill from the property of the Consolidated Copper mines. The copper mines at Pioche and in Lyon County were idle, but some copper was recovered from speiss shipped from Eureka.

Lead

The output of lead increased from 18,156,337 pounds in 1923 to about 19,400,000 pounds in 1924, and the value from $1,270,944 to about $1,560,000. The Yellowpine Mining Co., at Goodsprings, was the largest producer of lead, and the Combined Metals Co., at Pioche, was second. Other producers of lead were the Ward Leasing Co., White Pine County, the Eureka Holly, at Eureka, the Prince Consolidated tailings, Virginia Louise, Leadville, and the Spruce Monarch mines. The Simon Silver-Lead Mining Co., the chief producer in 1923, was idle.

Zinc

The recoverable zinc in the ore mined decreased from 14,166,550 pounds in 1923 to about 11,500,000 pounds in 1924. The Yellowpine Mining Co. was a regular shipper and the largest producer of zinc, though its output was less than in 1923. The decrease in the output of zinc from the Simon Silver-Lead mine was more than offset by the increase from the Combined Metals mine, at Pioche.

Silver

The production of silver decreased from 10,614,564 ounces in 1923 to about 9,500,000 ounces in 1924, and the value from $8,703,942 to $6,373,000. The Tonopah district produced about 5,076,000 ounces of silver, and the Tonopah Exten-

sion mine was by far the largest silver producer of the state. The mines of the Comstock district increased their output from 1,357,559 ounces to about 1,800,000 ounces. Other large producers of silver were the United Comstock, Tonopah Belmont, West End, Tonopah Mining, Betty O'Neal, Rochester Silver, Consolidated Cortez, and Leadville mines. The output of the Divide district was far below normal, the Nevada Packard mine was idle, and the Candelaria resumed operations only in November. The Combined Metals, at Pioche, produced much silver from lead-zinc ore milled at Bauer, Utah, and the operators of the tailing dumps near Pioche also produced considerable silver.

New Mexico

Copper, Lead and Zinc Production Gained, but Gold and Silver Show Decrease

THE metal mines in New Mexico produced about $521,000 in gold, about 839,000 ounces of silver, about 4,800,000 pounds of lead, 73,900,000 pounds of copper, and 20,000,000 pounds of zinc in 1924, having a total calculated gross value at the average prices for the year of $12,434,000, as compared with $551,713 in gold, 747,127 ounces of silver, 3,832,427 pounds of lead, 61,356,802 pounds of copper, and 16,496,000 pounds of zinc in 1923, having a gross value of $11,573,805.

The Chino Copper Co.'s mill at Hurley was operated with gradually increasing use of existing additional units until about 10,000 tons a day were being treated and the total gross content of copper in the various products (concentrates and raw ore) was 68,914,000 pounds, an increase over 1923 of 12,000,000 pounds. The concentration mill at Tyrone was idle, but expermients in leaching large quantities of low-grade copper ores were continued there. The Empire Zinc Co.'s magnetic mill at Hanover was operated steadily, the product, a high-grade zinc sulphide, going to the Empire Zinc Co.'s zinc oxide plant at Canon City, Colo. Lead-zinc oxide and sulphide ores were shipped from Kelly to the Ozark leaded-zinc oxide plant at Coffeyville, Kans. Siliceous ores carrying copper, silver, and gold were shipped from Lordsburg at the rate of 7,000 tons a month. The Mogollon Mines Co., at Mogollon, took over the Fanney mine and mill and adjoining properties and operated both the Last Chance mill and the Fanney mill until lack of water forced the closing of the Last Chance mill in November. As a result of these operations the output of the Mogollon district increased more thna 50 percent in silver and nearly 50 percent in gold. The North Homestead amalgamation mill at Whiteoaks, was a contributor of gold bullion. Placer gold was produced at Pinos Altos, Golden, and Baldy. Large quantities of iron-manganese were shipped from Chloride Flats, at Silver City, to Pueblo, Colo.

Ransome, U. S. Geol. Survey
In the Coeur D'Alene District, Idaho

Oregon

Gold Production Increased, But Silver and Copper Show Decrease.

THE value of the gold, silver, and copper mined in 1924 was $685,000, as compared with $767,590 in 1923.

The output of gold in 1924 is estimated at 26,900 ounces, valued at $556,000; the output in 1923 was 24,091 ounces, valued at $498,008. The increase is due largely to the resumption of dredging on Burnt River and to an increase in the output of the dredge on John Day River. The dredge on Powder River finished its ground about the middle of the year. Other forms of placer mining were less productive in 1924 than in 1923 because of severe drought, and the deep mines also made a smaller output.

The output of silver in 1924 is estimated at 41,450 fine ounces, valued at $28,000; in 1923 it was 96,322 ounces, valued at $78,984. The decrease is due largely to a curtailment of the output of the Bay Horse mine.

The output of copper in 1924 was about 781,000 pounds, valued at $101,000; that in 1923 was 1,283,476 pounds, valued at $188,671. Practically all of the copper produced in 1924 was obtained from the Homestead Iron Dyke mine.

No lead was produced in Oregon in 1924 and only 27,523 pounds in 1923.

Work Done at Individual Mines

In eastern Oregon the Cornucopia gold mine and the Homestead Iron Dyke copper mine continued production. Development work at the Bay Horse mine, near Huntington, was continued, financial arrangements for the construction of a mill were completed, and a little crude ore was shipped. The Mother Lode Mining Co. did a large amount of development work on the Poorman copper properties, northeast of Baker, with encouraging results. Near Sumpter the chief activity was at the Ibex mine, where a 50-ton mill was electrified, production was maintained, and good reserves of ore were developed. At the Baisley-Elkhorn mine no ore was produced, but deeper development was under way. The E. and E. mines remained closed. At Granite the Buffalo-Monitor and Le Belleview were producers, but the Imperial Eagle was not operated. The Empire dredge, on John Day River, was at work throughout the year. The new 6,000-cubic foot boat of the Superior Dredging Co., on Burnt River, started work about April 1, 1924, and has been digging steadily since.

Water was so scant in western Oregon in 1924 that few of the placer mines there made more than a few days' run and only in the spring. Snipers were out on the Rogue, Applegate, and Illinois rivers, but they had little success. At the Millionaire and Sylvanite quartz mines, near Gold Hill, development was continued, and a small stamp mill was put on the Millionaire property. The Skyline mine, near Ashland, was working. At Holland the Siskron mine was producing, and a short run was made at the Logan and Boswell placers. Near Galice the Oriole was actively developed and at the Mount Reuben, west of Leland, work was continued on the deep development tunnel. In the Bohemia district development was continued on the Bartels properties, and at Elkhorn,

north of Gates, in Marion County, the Lotz-Larsen Mining Co. is reported to have opened deposits of copper ore and made a small shipment.

Early fall rains made possible the resumption of placer mining at several places and the general impression is that mining will be resumed at a more nearly normal rate early in 1925.

South Dakota

Homestake, Only Mine Producing, Shows Decrease in Output, Although Considerable Development Is Being Done

IN 1923 the mines of the Black Hills, S. Dak., produced $6,406,206 in gold and 95,844 ounces of silver. In 1924 the only very productive mine was the Homestake, at Lead, which produced more than $6,000,000 in gold. A small quantity of gold was produced at Keystone from arsenical ores by amalgamation. At the Eagle Bird Mining Co.'s property, on Squaw Creek, the development adit was driven continuously, reaching a length of 2,000 feet. At the Cutting Mining Co.'s property, 2 miles west of Central City, development work was done during 1924 on several levels of the mine. A mill building has been erected, and concentration and flotation machinery capable of treating 50 tons a day will be installed in 1925. The Cutting will be the first plant in South Dakota to employ the flotation process. The Trojan mine, closed February, 1923, was idle during 1924. The Homestake Co. did some diamond drilling on the Uncle Sam property, at Roubaix.

Texas

METAL mines in Texas produced 720,000 ounces of silver and 44,000 pounds of lead in 1924. The greater part of the silver was taken from the Fresidio mine, at Shafter, which has been producing steadily since 1885. In the early years the ore was treated by the patio amalgamation process, but after 1911 by the modern cyanidation process. Some lead-silver ore was shipped in 1924 from Hudspeth County.

Utah

Marked Increase in Production of Copper, Lead and Zinc, With Slight Decrease in Gold and Silver. State Ranked First in Silver Production and Third in Both Copper and Lead

METAL mining in Utah in 1924 resulted in a marked increase over 1923 in the production of copper, lead, and zinc. The value of the gold, silver, copper, lead, and zinc was $65,609,000, a slight decrease from the value in 1923, caused by the decrease in the prices of silver, copper, and zinc, and in the quantity of silver produced. The state ranked first in the United States in the production of silver, third in that of copper, and third in that of lead.

Copper

The production of copper increased from 222,393,572 pounds in 1923 to 242,700,000 pounds in 1924. The high position of Utah as a copper producer, second only to that of Arizona and Montana, is due largely to the operations of the Utah Copper Co., which made an average of nearly 18,000,000 pounds a month, aided by increased recovery at the mills at Magna and Arthur. The Ohio Copper Co. produced 1,000,000 pounds a month by leaching ore in place and established a record for low cost. The Utah Consolidated, now Utah Delaware, also made a large output of copper, though less than in 1923. Other producers of copper were the Utah Apex, Silver King Coalition, Chief Consolidated, United States Mining, Tintic Standard, Park City, Ophir Hill, and Iron Blossom mines.

Diller, U. S. Geol. Survey

Placer Mine Near Waldo, Ore.

Lead

The output of lead increased from 203,447,793 pounds in 1923 to 231,425,000 pounds in 1924, an increase of 15 percent and a record for the state. The lead-smelting plant at Midvale was active, and the shipments of lead bullion from Murray and International were considerably increased. The Tintic Standard Mining Co. again made the largest output of lead in Utah, an output greatly in excess of that of any other company. Other large producers were the Silver King Coalition, Utah Apex, United States Mining, Chief Consolidated, Park City, Keystone, Bingham Mines, Niagara, Cardiff, Victoria, Park-Utah, and Ophir Hill mines. The output of lead from the Tintic, Park City, and Bingham districts was increased, but most of the increase was made by mines at Park City and Bingham. Much silver-lead ore and concentrate was also shipped from Alta, Ophir, Frisco, and Gold Hill. The Ophir Hill Consolidated Co. was active throughout the year, but nearly half of the lead concentrate it produced was stored for future shipment. One of the notable features of the mining industry in the state was the completion of the new milling plant of the Chief Consolidated Mining Co. at Eureka, where low grade ores are treated by flotation and leaching.

Zinc

The recoverable zinc in the ore mined increased from 11,330,913 pounds in 1923 to 16,000,000 pounds in 1924, though the average price was slightly lower than in 1923. Most of the output came from the United States and Niagara mines at Bingham, the ore of which is concentrated at Midvale. The Park City Mining & Smelting Co. was second in output, and the Ontario, Utah, Delaware, Pittsburg, Keystone, Silver King Coalition, and Chief properties followed. All zinc products were shipped to eastern plants, to the electrolytic plant at Great Falls, Mont., or to Pittsburg, Calif. Late in the year the International Smelting Co. purchased and milled mixed ores at International. The lead concentrate so produced was smelted at International and the zinc product was shipped to Great Falls, Mont.

Gold

The production of gold decreased slightly, from $3,076,483 in 1923 to about $3,038,000 in 1924. Large decreases from the Deer Trail and Utah Consolidated mines were partly made up by increases from the Utah Copper, Park-Utah, Silver King Coalition, and Tintic Standard mines. The mines of the Bingham (West Mountain) district produced about 70 percent of the gold output of the state, but did not greatly increase

Tonopah Mining Co., Tonopah, Nev.

U. S. Bureau of Mines photo
Tintic Standard Mining Co., Eureka, Utah

the output of the district. A good gain was made, however, from both the Tintic and Park City regions, especially during the last quarter of the year, when silver-lead ore brought a higher price. The largest producers of gold were the Utah Copper, Chief Consolidated, United States Mining, Utah Consolidated, Park-Utah, Utah Apex, Silver King Coalition, Tintic Standard, Bingham mines, Centennial Eureka, Park City, Niagara, and Victoria mines. As the Deer Trail mine was practically idle, nearly all the gold was derived from ores and concentrate smelted.

Silver

The output of silver decreased from the record output of 19,137,470 ounces in 1923 to about 17,000,000 ounces in 1924. The Tintic Standard Mining Company was not only the largest producer of silver in the state but its output exceeded that of any other property by more than a million ounces. The Chief Consolidated Mining Company, owning the Chief, Gemini, Grand Central, and Eureka Hill mines, was second in the production of silver, and the Silver King Coalition was third, making a greatly increased output. Other large silver producers were the Park-Utah, Park City (Judge and Daly West), United States, Utah Copper, Utah Apex, Victoria, Iron Blossom, Bingham Mines, Keystone, Cardiff, Ophir Hill, and Plutus mines, each producing more than 150,000 ounces of silver. The decrease in silver occurred largely in the Tintic district, despite the unusually large production of the Tintic Standard mine; partly in the Park City region, in spite of the increase from the Silver King Coalition property; and partly in Box Elder County, where the Vipont mine was idle. The output of silver from Bingham increased materially as a result of activity at the Utah Apex and United States mines.

Production By Districts

In 1924 the mines in Utah produced about 13,500,000 tons of ore, an increase from 12,752,998 tons in 1923. Of this total the Bingham district produced 12,633,000 tons, as compared with 11,829,839 tons in 1923. The estimated production of the district was 102,855 ounces of gold, 2,338,000 ounces of silver, 235,450,000 pounds of copper, 63,123,000 pounds of lead, and 11,697,000 pounds of zinc.

The mines of the Tintic district produced 345,300 tons of ore, as compared with 401,970 tons in 1923. The estimated production of the district was 26,285 ounces of gold, 7,729,700 ounces of silver, 2,865,000 pounds of copper, 77,765,000 pounds of lead, and 55,000 pounds of zinc. The mines that produced more than 5,000 tons of ore during the year were the Tintic Standard, Chief Consolidated, Victoria, Eagle & Blue Bell, Iron Blossom, American Star, and Plutus.

The shipments of ore, concentrate, and tailings from the Park City region increased from 172,197 tons in 1923 to 210,550 tons in 1924. The estimated output of the district was 13,049 ounces of gold, 5,508,000 ounces of silver, 2,174,000 pounds of copper, 66,554,000 pounds of lead, and 3,732,200 pounds of zinc. The output of gold and lead increased considerably; that of silver and zinc was less.

Mines in the Big and Little Cottonwood districts produced 15,350 tons of ore, containing 170 ounces of gold, 396,700 ounces of silver, 183,000 pounds of copper, and 5,840,000 pounds of lead. The large producers were the Cardiff, Columbus Rexall, Alta Merger, Michigan Utah, Emma, and West Toledo mines.

From Ophir and Stockton shipments of lead ore and concentrate amounting to about 14,000 tons were made from the Ophir Hill, Keystone (Galena King), Bullion Coalition, and Hidden Treasure mines. Much lead ore and iron-arsenic ore was shipped from Gold Hill and considerable old tailings from Frisco.

The dividends paid by mining companies in Utah in 1924, as shown by published statements, amounted to about $10,355,985, exclusive of $1,702,224 paid by the United States Smelting, Refining & Mining Co., which controls mines at Eureka and Bingham, as well as mines in other states. The companies that contributed to this total were the Utah Copper, Tintic Standard, Silver King Coalition, Park City Mining & Smelting, Park-Utah, Utah Apex, Chief Consolidated, Iron Blossom, Ohio Copper, Cardiff, and Silver Wave.

Washington

Decrease in Production of Gold, Silver and Zinc, with Substantial Increase in Copper and Lead Production

THE value of the gold, silver, copper, lead, and zinc produced in 1924 was $895,000, as compared with $1,065,666 in 1923. The mines of Washington produced more lead and copper than in 1923 but much less gold, silver, and zinc.

Copper

The output of copper increased from 871,999 pounds in 1923 to 944,800 pounds in 1924. Most of the output came from the property near Index belonging to the Sunset Copper Co., which resumed the shipment of copper concentrate in April. Copper ore and concentrate containing much silver were shipped by the United Silver Copper Co. at Chewelah.

Lead

The output of lead increased from 2,906,479 pounds, valued at $203,454, in 1923 to 3,650,000 pounds, valued at $293,800, in 1924. The Gladstone mine, near Northport, in Stevens County, was again the largest producer of lead in the state. Both sulphide and carbonate ore were shipped to the Bunker Hill smelter, at Bradley, Idaho. Lead concentrate was shipped from the Santa Rita mine, west of Springdale, and other shipments were made from the Old Dominion, Diamond R, and Consolidated Silver Mountain mines. Lead-silver ore was being developed at the Chloride Queen mine, north of Colville, where a mill was under construction.

Gold

The production of gold decreased from $342,067 in 1923 to $284,000 in 1924.

Very little gold bullion was produced in the state. The Boundary Red Mountain mine, in Whatcom County, was under development and made no output in 1924. though it produced much gold in 1923. Most of the gold produced was mined at Republic. About 14,680 tons of siliceous gold ore was shipped from the Republic district in 1924, as compared with 24,480 tons in 1923. The Knob Hill mine of the Balaklala Consolidated Copper Co. made the largest output of both gold and silver in the district. The Quilp mine took the lead in shipments of ore but made a smaller output of gold than in 1923. Other producers were the Last Chance and Old Republic mines. Several thousand tons of siliceous gold ore was shipped from the Last Chance mine, but the property was closed June 1, as the market for siliceous ore was limited by the requirements of the smelting company at Trail, British Columbia. No ore was shipped by the Northport Smelting and Refining Co., but considerable development work at depth was done at the Surprise property as well as at the Quilp and Knob Hill mines. Exploration work was resumed at the Golden Eagle mine.

Silver

The output of silver decreased from 227,187 ounces in 1923 to 193,500 ounces in 1924. Rich silver-lead ore was shipped from the Old Dominion mine, near Colville, the largest producer of silver in the state. The rest of the silver was produced by the mines at Republic, the copper property near Chewelah, and the Santa Rita mine, west of Springdale. The Deer Trail mine, an old producer of silver, was operated by the Venus Silver Mines Co., which was preparing for production and installing a concentration plant.

Zinc

The recoverable zinc in the ore mined decreased from 3,024,535 pounds in 1923 to 1,024,000 pounds in 1924. The Washington Black Rock Mining Co., near Northport, shipped less ore but did much development work.

ARSENIC IN 1924

Production And Sale Of Arsenic Broke All Previous Records, Nine Companies Producing White Arsenic—14,500 Short Tons

THE production and sales of arsenic in the United States in 1924 broke all previous records. Nine companies that produced white arsenic in the United States in 1924 reported to the Geological Survey their sales, which amounted to 14,500 short tons. The sales of the crude and refined product represented 71 percent of the total white arsenic produced, and the products were sold at an average price of 9 cents a pound.

IMPORTS BY MONTHS

During 1924 about 9,000 short tons of white arsenic was imported into the United States, as shown by the actual figures for 10 months and an estimate for the remainder of the year. In January 963 short tons of white arsenic was imported, in February 773 tons, and in the next four months the imports increased to more than 1,000 tons a month. In August and September the imports decreased to 285 and 339 tons, respectively, but in October they increased to 652 tons. From January to October, inclusive, the imports amounted to 8,211 tons, valued at $1,487,609, or 9.06 cents a pound.

MEXICO CONTRIBUTES LARGEST IMPORTS

Most of the white arsenic imported was produced in Mexico, but considerable quantities, in the order named, originated in Germany, Japan, Belgium, England, Canada, China, Dominican Republic, and Australia. Of metallic or elemental arsenic, produced in Belgium, Japan, and Germany, 155,642 pounds, valued at $24,113, or 15.5 cents a pound, was imported during the first ten months of the year. The shipments of sulphide of arsenic, probably largely realgar with some orpiment, amounted to 432,212 pounds, valued at $30,291, or 7 cents a pound. Most of the sulphide was shipped from Germany, but some was shipped from Canada, Belgium, and England. The sheep dip imported from England amounted to 68,071 pounds, valued at $6,112, or 8.9 cents a pound, and the imports of Paris green and London purple, of which there was 31,700 pounds, valued at $6,744, averaged 21.3 cents a pound. Arsenic acid, of which 220 pounds was imported, was valued at 31.8 cents a pound. No imports of calcium arsenate were reported.

SOURCES OF DOMESTIC ARSENIC

Twelve arsenic plants were in operation in 1924. Two of them recovered white arsenic from ores and used it for making calcium arsenate and one plant treated oxidized arsenical ore from which calcium arsenate was made directly. About 65 percent of the total refined and crude arsenic was obtained from ore roasted at 7 arsenic plants primarily for its content of arsenic, 24 percent was a by-product at copper smelters, and a little more than 9 percent was a by-product at lead reduction works. At Midvale and Murray, Utah, arsenic plants operated separately from the main smelting works produced nearly half the total output. The plant at Midvale produced refined and crude white arsenic, which was used largely in making weed killer. Part of this product is made at Midvale and part at the plant of the United States Lead refinery at East Chicago, Ind. The plant at Murray reduced arsenical ore to the crude product, which was shipped to Globe, Colo., for refinement. At the copper plant at Tacoma, Wash., refined white arsenic was made.

PRODUCERS CAN MEET ALL DEMANDS

General interest in arsenic was evident near the end of 1924, but buyers who were looking for lower prices had been influenced by reports that large surplus stocks were being carried in the United States. That there are considerable stocks of arsenic is true but they constitute only a small fraction of a good season's demand. Considerable ore containing arsenic is stockpiled at several points and can be held better in the crude ore than as the manufactured product. Most of the producers of white arsenic are in a position to produce heavily when there is a demand.

QUICKSILVER IN 1924

Industry Shows Increase In Production, With Increased Development Work For New Deposits

INCREASED production of quicksilver in the United States in 1924 is announced. Estimates made by C. P. Ross of the Geological Survey, show a total output of 9,600 flasks, of 75 pounds net, as compared with 7,937 flasks in 1923. This total may be somewhat increased when the final figures are available. In 1924 California produced 7,890 flasks and Texas, Nevada, Oregon, Idaho, and Alaska produced the remaining 1,710 flasks.

In California only 6 mines reported production, as compared with 9 in 1923, but most of these increased their output. The increase of more than 20 percent in the total production of the United States is the result of a large increase in the output of a few of the mines in California. Otherwise the total production would have decreased about 15 percent, although the average price in 1924 was higher than in 1923. Production was reported from only one mine in each of the States of Texas, Nevada, Oregon and Idaho, but a few mines in Nevada that may have made a small output have not yet been heard from. Of these four States, Texas made by far the largest production. A very small amount of quicksilver was produced in Alaska. In Arizona a little development work was done but no quicksilver was produced.

The average price of quicksilver in 1924 per flask of 75 pounds, as calculated from quotations by the Engineering and Mining Journal- (*Continued on page* 68)

MANGANESE IN 1924

Large Increase In Production—Montana And Colorado Large Shippers

THE shipments of high-grade manganese ore, containing 35 percent and more of manganese, in the United States in 1924, according to the Geological Survey, were approximately 53,000 gross tons, valued at $1,200,000, compared with 31,500 gross tons in 1923, valued at $874,973. This is the first year since 1920 in which the value of high-grade ore shipments has passed the million-dollar mark.

Notable increases in shipments were made by Colorado and Montana producers. In Washington, where no production of manganese ore had been made since 1916, a large quantity was produced and shipped from the Crescent mine, Port Angeles, in 1924. This is the first time that Washington has made a notable production of manganese ore. It is largely shipments from Washington and the increase in those from Montana—from 21,916 tons in 1923 to about 34,000 tons in 1924—that has caused the increase in manganese shipments in 1924. It will be noted that Montana shipments alone in 1924 were 2,500 tons higher than the total for the country in 1923.

Since September 22, 1922, the manganese content, not the gross weight, of ores imported and apparently the value of the ores has been recorded. The estimated manganese content of manganese ore imported is reported by the Bureau of Foreign and Domestic Commerce to have been 236,635 gross tons during the first 11 months of 1924 (January to November, inclusive), compared with 206,048 gross tons in 1923. Assuming an average manganese content of manganese ore imported of approximately 48-50 percent, the imports of ore during these periods were about 473,000 gross tons for 11 months in 1924 and 412,000 gross tons for 1923. The value of the imports is given as $5,505,658 for the first 11 months of 1924, and $3,874,510 for 1923.

The shipments of domestic ore containing 10 to 35 percent of manganese in 1924 dropped to 280,000 gross tons, valued at $862,000 from 319,666 tons in 1923 valued at $1,158,628. Shipments of ore containing 5 to 10 percent manganese dropped to 585,000 gross tons in 1924 valued at $1,670,000, from 1,072,457 tons valued at $3,598,327 in 1923. One reason for the large decrease in shipments of ore containing 5 to 10 percent of manganese is the return to iron-ore classification of the ore from the Tilden mine of the Oliver Iron Mining Company. For just one year, 1923, the ore from this mine contained sufficient manganese to necessitate its inclusion as a manganiferous iron ore instead of as an iron ore. On the other hand the Ottawa mine of the Montreal Mining Company shipped ore again in 1924 which had a high enough manganese content to be included with the ore containing 5 to 10 percent manganese.

1924 COPPER PRODUCTION

The Record For 1924 In The Production Of Copper Broke All Peace-Time Records, The Smelter Output Being More Than A Billion And A Half Pounds—A 13 Percent Increase Over 1923

THE production of copper in 1924 broke all previous records except those for the years during the World War. The output from domestic sources during the last year, as determined by the Geological Survey from reports of the smelters showing actual production for 11 months and the estimated production in December, was 1,628,000,000 pounds, compared with 1,435,000,000 pounds in 1923, an increase of more than 13 percent over that year, which itself was the highest of record with the exception of the war years. The smelter production of copper in December, as estimated by the producing companies, was 137,000,000 pounds, a little higher than the average monthly production for the year, or at the rate of about 1,644,000,000 pounds a year.

The production of new refined copper from domestic sources, determined similarly, was about 1,764,000,000 pounds, compared with 1,464,000,000 pounds in 1923. In 1924 the production of new refined copper from domestic and foreign sources amounted to about 2,293,000,000 pounds, compared with 1,980,000,000 pounds in 1923. In addition to the output of new refined copper about 136,000,000 pounds of secondary copper was produced at the refineries, compared with 131,000,000 pounds in 1923, so that the total output of refined copper was about 2,429,000,000 pounds in 1924 and 2,111,000,000 pounds in 1923.

Largest Imports and Nearly the Largest Exports

The imports of unmanufactured copper during the first 11 months of 1924, according to the Bureau of Foreign and Domestic Commerce, amounted to 706,127,251 pounds, compared with 676,473,338 pounds during the entire year 1923 and 541,013,220 pounds in 1922. The imports of copper in the first 11 months of 1924 were thus higher than during any previous calendar year.

The exports of copper also increased substantially during the first 11 months of 1924 and were higher than those recorded for any other calendar year except 1917. The exports in December will probably not be quite large enough to make the figures for 1924 surpass those for 1917. The exports for the first 11 months of 1924 amounted to 1,018,426,271 pounds, compared with 829,314,002 pounds during the entire year 1923. The figures showing the imports and exports in December will be available in the Bureau of Foreign and Domestic Commerce later.

Less Stocks at Refineries

The stocks of refined copper in the hands of domestic refineries on December 31, 1924, as estimated by the refining companies, were about 247,000,000 pounds, compared with 264,000,000 pounds on December 31, 1923. The stocks of blister copper and material in process of refining, in the hands of the smelters, in transit to refineries, and at refineries on December 31, 1924, were estimated by smelting and refining companies at about 405,000,000 pounds, compared with 432,000,000 pounds on December 31, 1923.

The quantity of primary refined copper withdrawn on domestic account during the year was about 1,452,000,000 pounds, compared with 1,301,000,000 pounds in 1923, calculated as follows:

	1923	1924
Refinery production of new copper from domestic sources	1,464,000,000	1,764,000,000
Refinery production of new copper from foreign sources	516,000,000	529,000,000
Imports of refined copper (December estimated, 1924)	161,000,000	152,000,000
Stocks of new refined copper, January 1	216,000,000	264,000,000
	2,357,000,000	2,709,000,000
Exports of refined copper (ingots, bars, rods or other forms)	792,000,000	1,010,000,000
Stocks December 31	264,000,000	247,000,000
	1,056,000,000	1,257,000,000
Total withdrawn on domestic account	1,301,000,000	1,452,000,000

LEAD AND ZINC IN 1924

Lead Mining Made A Gain Of 8 Percent And Lead Smelting And Refining A Gain Of 15 Percent—Geological Survey Issues Annual Estimate For Industry

Lead Mining

THE output of soft lead from mines in the Mississippi Valley and the small output from mines in Eastern States together amounted to about 276,000 short tons, and that of argentiferous lead from mines in the Western States amounted to about 312,000 tons, a total of 588,000 tons. The corresponding figures for 1923 were 257,688 tons from the Mississippi Valley and the Eastern States and 287,903 tons from the Western States, a total of 545,591 tons. The southeastern Missouri district made the largest output, about 192,000 tons, as compared with 167,458 tons in 1923, a gain of 15 percent. The Coeur d'Alene district of Idaho came next, with about 128,000 tons, as against 121,178 tons in 1923. Utah ranked third, with an output of about 116,000 tons, a gain of 14 percent over that of 1923.

The imports of lead in ore for 11 months were 43,806 tons, more than 70 percent of which came from Mexico. The content of lead in ore and base bullion in bonded warehouses on November 30 was 102,153 tons.

The price at Joplin of 80 percent lead concentrates was $107.50 a ton at the beginning of the year. The price rose from week to week and reached $125 by the first of March. At the middle of March the price began to decline and by successive drops it reached $77.50 a ton near the end of May. This was the lowest price recorded during the year. By June it reached $80, where it stood for nearly two months. During the last week of July the price rose to $85.50. From that point a steady upward trend in prices started, which was maintained to the end of the year except for a slight backward movement about the first of October. By the middle of October it recovered and stood at $110 a ton. Since that time the increase has been unbroken, and by the middle of December it reached $130, the highest price reached in the history of the Joplin district.

Zinc Mining

The recoverable zinc contained in ore mined in 1924 was about 636,000 short tons, as compared with 610,394 tons in 1923. The output of the Eastern States was about 105,000 tons (80 percent from New Jersey), that of the Central States about 406,000 tons, and that of the Western States about 125,000 tons, one-half of which was from Montana and one-fourth from Colorado. The output of the Central and Eastern States showed a gain over that in 1923, and the output of the Western States showed a small loss. Virginia again produced lead and zinc ores after several years of no production. Kansas remained stationary, with 101,000 tons, but Oklahoma, with 276,000 tons, gained 14 percent.

At the end of November the imports of zinc in ore during 1924 amounted to 3,935 tons, and the zinc content of zinc ore in bonded warehouses amounted to 5,463 tons. While the market for zinc concentrates was depressed, during the summer, two or three trial shipments of Joplin concentrates were made to Belgium.

Sixty percent zinc concentrates sold in the Joplin district for $42.50 a ton at the beginning of 1924. The price rose to $45 at the end of February and dropped to $38.50 by the middle of April and remained near this figure until August. It rose to $43 near the end of August and declined to $41 by the end of September, when it recovered and began a climb which continued until the end of the year, reaching a peak of more than $50 a ton.

Lead Smelting and Refining

The output of primary domestic desilverized lead in 1924 was about 306,000 tons, of soft lead about 222,000 tons, and of desilverized soft lead about 63,000 tons, making a total output from domestic ores of about 591,000 tons of refined lead, compared with an output of 543,841 tons in 1923, which was made up of 291,760 tons of desilverized lead, 190,749 tons of soft lead, and 61,332 tons of desilverized soft lead. The output of lead smelted and refined from foreign ore and bullion was about 119,000 tons, as compared with 74,481 tons in 1923. The total lead smelted or refined in the United States in 1924 was thus about 710,000 tons, as compared with 618,322 tons in 1923, a gain of about 92,000 tons. The output of antimonial lead in 1924 was about 13,000 tons, as compared with 14,190 tons in 1923.

The imports of refined pig lead in the first 11 months of 1924 were 12,111 tons, as compared with 21,099 tons in the whole of 1923. Of the imports in 1924, 9,501 tons came from Mexico. The base bullion imported in 11 months contained 72,466 tons of lead, of which 72,152 tons came from Mexico. The lead of foreign origin exported in 11 months amounted to 65,941 tons, as compared with 48,236 tons in 1923; and that of domestic origin amounted to 5,146 tons, as compared with 1,999 tons in 1923. From a total supply of about 725,000 tons of refined lead (exclusive of stocks) there was withdrawn for export or remained in warehouse about 88,000 tons, leaving 637,000 tons available for consumption in the United States, as against 574,043 tons in 1923 and 472,705 tons in 1922.

The average quoted price of lead for prompt delivery at New York in 1924 was about 8.3 cents a pound, as compared with an average selling price of 7 cents in 1923. At the beginning of 1924 the price was 8.3 cents. It rose steadily through January and February until it reached 9.875 cents. It declined through March, April, and May, reaching 7 cents near the end of May. This price prevailed through June and most of July. The average quotation for August was 7.95 cents; for September, 8.07 cents; for October, 8.37 cents, and for November, 9.01 cents. A further advance in December brought it above 10 cents by the end of the year.

Zinc Smelting

The output of primary metallic zinc from domestic ores in 1924 was about 515,000 tons and that from foreign ores was about 1,000 tons, a total of 516,000 tons, as compared with 508,335 tons from domestic ores and 2,099 tons from foreign ores, a total of 510,434 tons, in 1923. In addition to the output of primary zinc there was an output of about 35,000 tons of redistilled secondary zinc, as compared with 39,434 tons in 1923, making a total supply of distilled and electrolytic zinc in 1924 of about 551,000 tons, composed of 162,000 tons of high grade and intermediate, 71,000 tons of select and brass special, and 318,000 tons of prime western zinc. The output of corresponding grades in 1923 amounted to 148,252, 90,459, and 311,157 tons, respectively. Of the total output of primary zinc in 1924 about 29,000 tons was made in Arkansas, 93,000 tons in Illinois, 116,000 tons in Oklahoma, and 84,000 tons in Pennsylvania. The production in 1924 differed but slightly from that in 1923.

The imports of foreign slab zinc for 11 months amounted to only 20 tons. The exports of slab zinc made from domestic and foreign ores amounted to 61,367 tons, including 3,458 tons of rolled zinc. The stock of zinc reported at smelters at the end of November was about 33,000 tons. No slab zinc was reported in warehouse. The apparent consumption of primary zinc in 1924 was about 450,000 tons, compared with 446,514 tons in 1923 and 373,090 tons in 1922.

At the end of November 79,000 retorts were in operation, out of a total of 134,000 retorts, at (*Continued on page* 66)

IRON IN 1924

Total Production From Principal Iron Ore Producing States Shows Production About 98 Percent Of Normal Output

THE iron ore mined in the United States in 1924, exclusive of ore that contained more than 5 percent of manganese, was 54,021,000 gross tons, a decrease of 22 percent as compared with that mined in 1923. The ore shipped from the mines in 1924 is estimated at 51,996,000 gross tons, valued at $151,385,000, a decrease of 26 percent in quantity and of 37 percent in value as compared with the figures for 1923. The average value of the ore per gross ton at the mines in 1924 is estimated at $2.91; in 1923 it was $3.45. The stocks of iron ore at the mines, mainly in Michigan and Minnesota, apparently increased from 10,165,875 gross tons in 1923 to 12,150,000 tons in 1924, or 20 percent. The considerable decrease in output may be ascribed in part to a slowing up in demand for steel and to general reaction in pig-iron manufacture during the middle of 1924, following the record year 1923, in which there was some overproduction. The decrease in the average value of iron ore at the mines of 54 cents a ton was largely due to the lowering of base prices of Lake Superior iron ores 80 cents a ton for the season of 1924. Lesser decreases in values occurred in all the other groups of states except those in the West.

These estimates are based on preliminary figures furnished by producers of about 98 percent of the normal output of iron ore. They show the totals for the principal iron-ore producing states, and, by grouping together certain states, the totals for the Lake Superior district and for groups of Southeastern, Northeastern, and Western States.

Lake Superior District

About 83 percent of the iron ore shipped in 1924 came from the Lake Superior district, in which approximately 44,862,000 gross tons was mined and 43,202,000 tons was shipped, decreases of about 24 and 27 percent, respectively, as compared with the quantities mined and shipped in 1923. The ore shipped in 1924 was valued at $132,207,000, a decrease of about 38 percent. These totals include the ore from the Mayville and the Baraboo mines in Wisconsin and ore shipped by rail as well as by water from all mines, but exclude manganiferous ores that contained more than 5 percent of manganese. The ore is chiefly hematite. The stocks of iron ore in this district apparently increased from 9,187,288 gross tons in 1923 to about 10,806,000 tons in 1924, or 18 percent. The shipments of iron ore by water from the Lake Superior district in 1924 (including manganiferous iron ores), according to figures compiled by the Lake Superior Iron Ore Association, amounted to 42,623,572 gross tons, a decrease of 28 percent as compared with these shipments in 1923. The average value of the ore at the mines in the Lake Superior district in 1924 per gross ton was $3.06; in 1923 it was $3.62.

The mines in Minnesota furnished 72 percent of the total iron ore shipped from the Lake Superior district in 1924 and 60 percent of the total of the United States. The mines in Michigan furnished 26 percent of the lake shipments and 22 percent of the grand total.

Southeastern States

The Southeastern States, which constitute the second largest iron-ore producing area, including the Birmingham and Chattanooga districts, mined approximately 7,320,000 gross tons of iron ore in 1924, a decrease of nearly 2 percent as compared with 1923. The shipments of ore from these States to blast furnaces in 1924 amounted to 6,867,000 gross tons, valued at $14,641,000, a decrease in quantity of 10 per cent and in value of 17 percent as compared with the quantity and value of shipments in the previous year. The ore consists mainly of hematite; brown ore and magnetite come next in order. The average value of the ore produced in these States in 1924 per gross ton was $2.13; in 1923 it was $2.31. Conditions in the Birmingham district, Alabama, seem to have continued more favorable throughout the year than in other parts of the South.

Northeastern States

The Northeastern States which include the Adirondack district, New York, and the Cornwall district, Pennsylvania, in 1924 mined 1,097,000 gross tons of iron ore and shipped 1,185,000 tons, valued at $3,071,000, decreases of 40 percent in the quantity mined, 42 percent in the quantity shipped, and 56 percent in value of shipments as compared with 1923. The average value of the ore in these States in 1924 per gross ton was $2.59; in 1923 it was $3.35. Most of this ore is magnetite.

Western States

The Western States that ordinarily produce iron ore named in the order of their importance, are Wyoming, New Mexico, Utah, Montana, Colorado, and California. Occasionally Idaho, Nevada, and Washington contribute small quantities. All the ore from Wyoming, New Mexico, and Colorado, and most of that from Utah, is used for the manufacture of pig iron. Much of the remainder is used as a flux in smelting copper and the precious metals. It is estimated that the Western States mined and shipped in 1924 approximately 742,000 gross tons of iron ore, valued at $1,466,000, an increase of 10 percent in quantity and of 13 percent in value as compared with 1923. The ore comprises hematite, magnetite, and brown ore. The increase in output, which was the only one recorded for a group of States in 1924, was due to the opening on a commercial basis of mines in the Iron Springs district, Utah.

Imports and Exports

The imports of iron ore reported for the eleven months ended November 30, 1924, amounted to 1,861,480 gross tons, valued at $9,656,087, or $5.19 a ton, which is higher than seems consistent with values of domestic ore. The imports for the year 1923 were 2,768,399 gross tons, valued at $11,304,737, or $4.08 a ton. The reported exports of iron ore

Estimates of iron ore mined and shipped in the United States in 1924 and actual output in 1923.

District	Ore mined (gross tons) 1923	Ore mined (gross tons) 1924	Ore shipped 1923 Gross tons	Ore shipped 1923 Value	Ore shipped 1924 Gross tons	Ore shipped 1924 Value
Lake Superior:						
Michigan	14,174,468	12,333,000	14,065,561	$54,110,070	11,293,000	$35,554,000
Minnesota	44,348,296	31,837,000	44,556,053	158,402,788	31,120,000	94,605,000
Wisconsin	871,416	692,000	831,412	2,421,194	789,000	2,048,000
	59,394,180	44,862,000	59,453,026	214,934,052	43,202,000	132,207,000
Southeastern States:						
Alabama	6,783,146	6,842,000	6,922,663	15,540,198	6,386,000	13,333,000
Georgia	117,321	116,000	117,286	300,712	116,000	284,000
Missouri	53,546	86,000	54,348	247,975	86,000	392,000
North Carolina	59,684	11,000	59,684	161,603	11,000	28,000
Tennessee	267,275	167,000	266,175	677,753	166,000	411,000
Virginia	155,977	78,000	200,966	664,240	82,000	193,000
	7,436,949	7,320,000	7,621,122	17,592,481	6,867,000	14,641,000
Northeastern States:						
New Jersey	307,733	65,000	349,435	1,403,723	99,000	412,000
New York	541,922	250,000	722,096	3,242,229	305,000	1,419,000
Pennsylvania	993,441	782,000	988,586	2,264,485	781,000	1,240,000
	1,843,096	1,097,000	2,060,117	6,910,437	1,185,000	3,071,000
Western States	677,217	742,000	677,207	1,301,951	742,000	1,466,000
Grand total	69,351,442	54,921,000	69,811,472	240,738,921	51,996,000	151,385,000

for the eleven months ended November 30, 1924, amounted to 585,960 gross tons, valued at $2,360,968, or $4.03 a ton, as compared with exports for the entire year 1923 of 1,116,932 gross tons, valued at $5,305,365, or $4.75 a ton. The statistics of imports and exports were compiled from the records of the Bureau of Foreign and Domestic Commerce, of the Department of Commerce.

The table on the preceding page shows the quantity and value of the iron ore mined and shipped in the United States by the principal producing States. The figures for 1923 are final, but those for 1924 are subject to revision.

PIG IRON

The production in 1924 of pig iron, excluding charcoal iron and including blast-furnace ferroalloys, according to the Iron Trade Review, was 31,060,183 gross tons, compared with 40,025,850 tons in 1923, a decrease of 22 percent.

THE SILVER DOLLAR

THERE has been a consistent effort on the part of silver producers to secure a larger distribution of the silver dollar. The Utah Chapter of the American Mining Congress adds another step in this important movement, in a letter which was sent to all the banks of the State of Utah, urging a wider use of the silver dollar. For many years Utah has been the chief silver producer of the United States, its mines having produced in 1923 19,137,470 ounces, and in 1922 17,271,100 ounces, and about 17,000,000 ounces for 1924. Mr. Mackenzie's letter to the banks is as follows:

"You have no doubt noted the program of Secretary Mellon to increase the use of silver dollars. The Treasury Department is setting an example by using silver dollars in part payment of its own employes and is urging other government departments to take like action. The Treasury Department has found that the upkeep of paper money costs the government about 3 percent of its total face value, while maintenance of silver dollars costs practically nothing. Mr. Mellon says in his annual report:

> " 'There are many reasons why the silver dollar should be restored to its former importance in the currency structure. The life of a silver dollar is indefinite. If the Treasury can restore to circulation 30,000,000 silver dollars in the United States and 10,000,000 in insular possessions, it can displace equal amounts of paper currency at an annual saving of $828,000. The use of the silver dollar is not an innovation. It has merely lost its place temporarily in circulation in certain localities and it is proposed to restore a limited amount of these coins as an auxiliary to paper currency.'

"An inquiry shows that the banks of Utah are receiving from the federal reserve bank an astonishingly small number of silver dollars in comparison with the total amount of money our Utah banks use. Utah has been for several years the leading silver-producing state of the nation, and we feel that this state should not only supplement the campaign of the government for the sake of the advantage which, as Mr. Mellon points out, will accrue to the government, but also should set an example to other states for patriotic and also for selfish reasons.

"It is not necessary to point out to you gentlemen, as bankers, that the great value of the mining industry to the state is in the number of persons it employs, all of whom are consumers of the state's other products and services. Silver is an extremely important factor in our metal mining industry; in fact, there is practically no metal mine in the state that is unaffected by the silver situation. You may be interested to know that there are only about a dozen metal mines on an earning basis in the state today, and that this condition is largely due to the silver situation.

"It is to the direct advantage of all the people of the state to take any feasible steps that will tend to increase the metal mine operations and thereby increase employment. There are several thousand unemployed men in the state today, many of whom are miners.

"For the reasons given we feel sure that you will receive heartily our suggestion that you do all you consistently can do to stimulate the use of silver dollars in your community. It is suggested that your tellers offer silver dollars instead of currency to your patrons up to $5 in amount and that you urge the business men of your community to use silver dollars in change among their customers and bank the one and two-dollar bills instead of continuing them in local circulation. Our inquiries indicate that the use of the silver dollars as indicated facilitates making change and reduces the liability of mistakes, as the coins are much easier to handle than the currency.

"We are advised that the Salt Lake City branch of the federal reserve bank will, until further notice, supply silver dollars to you without the transportation charges previously imposed, so that you can obtain the silver on the same basis as currency.

"Until the last few years the West was thoroughly habituated to the use of coin so that it should not be difficult to reinstate the silver dollars as a preferred form of money, and we believe the bankers of Utah can render real constructive service to the entire state in this way."

The response to this request was met with gratifying promptness, says the Salt Lake Tribune, which points out that:

> "Salt Lake banks made immediate and gratifying response to the call on Tuesday of the Utah Chapter of the American Mining Congress for Utahans to aid the movement to reinstate the silver dollar into popular use. In conformity with the request of Secretary A. G. Mackenzie, of the Utah Chapter, that silver be used whenever practical, tellers of Salt Lake banks offered on Wednesday white metal dollars to patrons, and much more silver, particularly new coins, was in evidence than usual.
>
> "The importance of this undertaking to Utah business cannot be overestimated. Mining constitutes the industry of paramount importance in the state. Eighty-five percent of the railroad freight within the state is derived from the mining industry. Since practically all of Utah metal mines produce silver, either as a main or a by-product, the stimulation of the prosperity of the silver industry means the stimulation of every industry in the state.
>
> "For several years Utah has been the chief silver producer in the United States. In 1923 the mines of the state turned out 19,137,470 ounces; in 1922, 17,271,100 ounces. This year, notwithstanding that the price of the white metal has fluctuated between a low of approximately 63 cents an ounce and a high of 72 cents, as compared with $1 an ounce during 1922 and the first five months of 1923, it is probable that Utah will retain its hold on premiership in the field of silver production.
>
> "Upkeep of paper money is 3 percent of its total value, according to the Treasury Department, while maintenance of silver dollars costs practically nothing, since the life of a silver dollar is indefinite."

LEAD AND ZINC IN 1924

(*Continued from page* 64)

plants that had operated during a part or all of the year, as compared with 86,670 retorts in operation at the end of 1923. The number of retorts expected to be in operation at the end of 1924 was about 83,000.

The average quoted price for prime western zinc at St. Louis in 1924 was about 6.3 cents a pound, as compared with an average selling price for all grades in 1923 of 6.8 cents. Quotations in 1924 ranged from 6.25 cents at the beginning of the year to 7.7 cents at the close. Low prices (down to 5.65 cents) prevailed late in May. The price gradually strengthened during the last quarter of the year.

THE ANTHRACITE INDUSTRY IN 1924

Production Normal, Being Approximately The Average Over A Fifteen-Year Period. Strikes Were More Prevalent Than Ever Before In The History Of The Industry. For First Time Since 1914 There Was No "Investigation" Of The Industry Under Way

EXCEPT for "outlaw" strikes which in 1924 infested the anthracite region to a greater extent than in any other year in the history of the industry, conditions were as close to normalcy as is ordinarily obtained. Assuming that the tonnage for December will equal the customary output for that month, the total output for the year, including colliery consumption, will have amounted to between 79,600,000 and 80,000,000 gross tons. This compares with an average annual production of 79,510,045 gross tons for the last 15 years, omitting the two abnormal war years of 1917 and 1918, and the strike year of 1922—the two being years of unusually heavy production, and the one because of complete idleness for more than five months, being a year which ran approximately 30,000,000 tons below normal. If those three years be included in the comparison the average production annually for the last 15 years was slightly more than 78,615,000 gross tons.

As indicative of the nonfluctuating character of the anthracite industry, its production not being as responsive to changing industrial conditions as is the production of bituminous coal, it may be stated that in eight years since 1910 the tonnage did not exceed 82,000,000 gross tons or fall below 78,000,000 tons. Omitting the three years mentioned, the minimum production in the period was in 1912—75,322,855 tons, or 5.3 percent below the average—and the maximum production, somewhat abnormal because of the deficiency produced by the strike of the previous year, was in 1923 83,338,401 gross tons, or a little less than 5 percent above the average. The difference between the years of lowest and highest production was 8,015,546 gross tons, or about 10 percent.

The production in 1924 would probably have exceeded the 15-year average by from 2,000,000 to 4,000,000 tons and have approached the record made in 1923 had it not been for a disastrous freshet that drowned out many mines in the latter part of September, and for what has been, as already stated, the worst series of outlaw strikes ever known in the hard-coal region. The chief center for the outlaw strikes was in the Wyoming field, and several of them involved as many as 12,000 men.

The responsible officials of the United Mine Workers have repudiated these strikes as violations of the agreement and have expressed their condemnation in a practical way by revoking, on at least two occasions, the charters of the local unions that were in rebellion against the established order. The most flagrant instance of this strike outlawry occurred in the mines of the Pennsylvania Coal Company, where eight collieries, employing about 11,000 men, were idle from November 24 until the end of the year. The striking workmen in this instance, as in most of the others, have been influenced by what is known as the General Grievance Committee, self-constituted groups which are not recognized in the agreements and are consequently of themselves of an outlaw character. The statement made on behalf of the Pennsylvania Coal Company by its vice-president and general manager, A. K. Morris, and published in the Scranton Republican on December 22, was to the effect that up to that time the employes on strike in the mines of that company had lost in wages approximately $1,685,000.

Complete figures of the tonnage which might have been mined and was not mined by reason of these strikes are not available, but from such information as has been obtained a conservative estimate would place such lost tonnage at not less than 2,000,000 tons. When to this deficiency is added the tonnage lost by reason of the September flood it can be seen that but for these occurrences the production in 1924 would have closely approached the record made in 1923, which, with the exception of the war years of 1917 and 1918, was the largest in the history of the industry.

Wages in the anthracite region during the year 1924 were at the highest level ever known, having been based upon the award of the United States Coal Commission appointed by President Wilson in 1920 and enhanced by the action of Governor Pinchot in September, 1923. The principal effect of the Governor's action was to add a flat increase of 10 percent to all existing rates of wages and in addition made necessary certain other adjustments of working hours which, while not adding materially to the earnings of the workmen, did add to the cost of anthracite production. As a result of this piling of Pelion on Ossa, the labor cost involved in the production of anthracite in 1924 was practically three times what it was prior to the World War. A recent investigation by the National Industrial Conference Board giving comparison of earnings in five basic industries shows that workers in the anthracite region had increased their earnings 196 percent from 1914 to 1924, compared with which workers on the railroads and in manufacturing establishments had gained 128 percent, workers in the building trades had gained 101 percent and the wages of workers in the agricultural pursuits had increased 70 percent. The peak in the cost of living, as reported by the United States Bureau of Labor Statistics, was in June, 1920, when the cost of living was 116.5 percent above 1913 and 110.2 percent above 1914. During the first nine months of 1924 the cost of living, according to the same authority, was about 70 percent above 1913, while the anthracite wage rates are reflected in earnings showing nearly 200 percent increase. The cost of living and the wage rates in other industries have receded since the war. The wage rates in the anthracite region are now about 30 percent above the war-time peak.

These conditions are naturally reflected in the prices for the domestic sizes of anthracite which have consistently maintained, during the last year, a higher price level than in any other previous period in a generation, the effect of which has been shown in the lessened movement to distant consuming territory to which the higher freight rates add another burden to the cost of the consumer. In the first ten months of 1924 the shipments of Pennsylvania anthracite into Canada amounted to 2,921,550 gross tons as compared with 3,756,567 gross tons in the same period in 1923. The

The Great Marvin Breaker of the Hudson Coal Co.

shipments by Lakes up to the time of the close of navigation in 1924 were about 2,731,829 gross tons against 3,095,163 tons in 1923. Shipments into New England in the first nine months of 1924 were 7,094,643 gross tons as compared with 8,064,209 tons in 1923. A substantial proportion of the decreased shipments into New England, however, can be attributed to the industrial depression which obtained during the earlier months of 1924 and which reduced the earnings of the mill workers and hindered them from buying their winter supply early in the year.

But, while the prices of prepared sizes of anthracite have of necessity, in order to meet the increased cost, been held at high levels, the smaller sizes, or what are designated as the steam sizes, have been unable to bear any part of the increased burden imposed by the Pinchot settlement of 1923. Owing to the fact that these sizes are used principally as steam making fuel they must compete with the more cheaply mined bituminous coal and are accordingly, and also of necessity, sold at less than the cost of mining and preparation, and in sympathy with the lower prices of bituminous coal resulting from the overproduction of that commodity, the prices of the steam sizes of anthracite have been lower in 1924 than they were in 1923. Some amelioration of these conditions may be hoped for in the not distant future, however, because of the fact that the coal-consuming public is learning that these small sizes have actual merit as a domestic fuel. This is in line with sound domestic economy as it points out a way to reduce the domestic fuel bill without expensive changes in heating equipment, and is also in line with real conservation as it tends to make available for household use a greater proportion of what, after all, is the only safe, clean, reliable household fuel with which the public in the northeastern part of the United States is familiar.

Thirty or forty years ago, Pea coal was considered a steam fuel, but since that time many persons by actual tests have found that they can run small heaters, laundry stoves and kitchen ranges with Pea coal at a considerable saving over the cost of Chestnut or Stove sizes. Pea coal is now recognized as a domestic fuel, and only a relatively small part of the production is used for other purposes. It sells at the mines at about two-thirds the price of Stove or Chestnut. In a similar way, a growing number is finding that coal bills can be reduced by using Buckwheat for domestic heating, either by itself in approximate heating equipment or in combination with larger sizes in their old furnaces. As the price of Buckwheat at the mines is barely one-third as much as the prepared sizes, the saving is a large item and the consumer is still using good clean anthracite.

To encourage this, and to give consumers the proper information about the use of Buckwheat, a campaign of education was begun in the winter of 1923-24. The Anthracite Economy Service was organized and Anthracite Economy Exhibits were established in Philadelphia, New York, Boston and Washington. These stations not only told the facts about Buckwheat coal, but they contained samples of the types of heating equipment in which Buckwheat can be used, and owners of older styles of heating apparatus received first-hand information on how to burn the small sizes economically.

The results of these displays justified the establishment of permanent service stations in the cities named, as well as in Brooklyn, and a temporary station for the three winter months was opened in Baltimore. Besides, a traveling exhibit was organized. It began in Portland, Maine, September 1, and has been making stops of one week in the larger cities of New England. During the first half of 1925 this traveling exhibit will cover New York, New Jersey, eastern Pennsylvania and Delaware. It is meeting with pronounced success if attendance at and interest in the exhibit may be taken as a sign.

The problem of mounting taxation is one which concerns every citizen, and the Pennsylvania legislature is about to receive a report from its own specially appointed Tax Commission, which for two years has been gathering data on taxation and its effects. The Anthracite industry, like every other industry, and, indeed, every individual, has had many complicated taxation problems to encounter.

One troublesome complication arose out of the effort, in some of the anthracite counties, to create what in effect would be a new method of taxing mineral properties by estimating their content, estimating a unit value per ton in the ground, and taking this theoretical result as the actual value upon which taxation could be based. The net result of this was that theoretical values of $10,000 or even $12,000 per acre would be placed on lands which had actually sold for as low as $600 to $800 per acre. One county endeavored to raise coal land valuation, under this system, from about $60,000,000 to more than $422,000,000. Under any such system, by reason of the vastly enhanced local and county taxes which would be collected, a burden of a much as 50 to 75 cents additional would be placed on every ton of prepared anthracite produced in that county.

The air was somewhat cleared when Justice Walling, of the Pennsylvania Supreme Court, on May 12, decided in what is known as Kemble's Appeal that mineral land was like any other real estate; that it must be taxed on the basis of actual selling value as such value is determined by competent witnesses and not on any theoretical calculation of what lies in the ground; and that this principle was not only the law of Pennsylvania but that it had been upheld as such in a long and unbroken line of decisions.

In the particular case of this appeal the upshot was that a small tract of inferior land which had been theoretically valued as worth more than $800 an acre, was finally adjudged worth only $200 an acre as the outside selling price, and its tax levy was imposed accordingly. It is thought that this decision, together with others on similar issues raised within and without the anthracite region, will exert a strong influence in clarifying and solving this aspect of mineral land taxation.

In an annual review of the anthracite industry it is customary to refer to some investigation to which it has been subjected during the year. The year 1924 notes an exception, as for the first time since 1914 the anthracite industry functioned for full twelve months without some sort of an investigation—State or Federal, administrative, legislative or judicial, being under way or projected.

QUICKSLIVER IN 1924

(*Continued from page* 62)

Press, was $69.51 in New York and $68.69 in San Francisco. The price at the first of the year was $60 in New York and $59.35 in San Francisco. It reached a peak of $75 in San Francisco in the middle of April, but rose to $79 in New York early in May. After that date the price declined rather steadily to $68 in New York and to about $69 in San Francisco early in December but rose to $74 in New York and $72.65 in San Francisco at the end of the year.

The decrease in the number of producing mines in California and in the amount produced in the other States offsets the encouragement offered by the increase in total production. It appears that under present conditions only the best and most favorably situated mines can be operated profitably, yet reports of development work in Nevada and elsewhere encourage the hope that operations in some of the newer quicksilver districts may eventually prove successful.

The Rotary Club of New York asked Congress to establish a permanent museum collection of samples of all coinage from the beginning of the government in the old sub-treasury building in New York.

BITUMINOUS COAL INDUSTRY IN 1924

Recent Statements Issued By Department Of Commerce And National Coal Association Show Decreased Production, Keen Competition And Difficult Labor Situation

A PRELIMINARY statement of the production of bituminous coal in the United States by the Geological Survey shows that production of 1924 was 467,700,000 net tons. Comparing this production with the six post-war years makes 1924 fare badly. However, three of the other five were not as good in point of tonnage, and only two years were better in point of tonnage; 1924 is 3½ percent under the average of the whole six years.

A recent statement released by the National Coal Association points out that:

"The outstanding event of the year 1924 in the bituminous coal mining industry was the signing of the Jacksonville agreement. The signers of that document entered into an agreement to continue for the period of three years the wage scale originally established in the summer of 1920. Under that scale the basic rate paid to men performing work requiring comparatively little skill is $7.50 a day. The effects of that agreement have been felt already in many ways and will continue to be felt for years to come.

Inside a Modern Coal Washery

"The most obvious effect has been in the decline in union production and increase in nonunion production. From a division of approximately 60 percent union and 40 percent nonunion the year 1924 showed conditions practically reversed. As another indication of this change may be quoted the fact that, in comparison with the record year of 1920, nonunion states showed an increase in production; Alabama, 18 percent; Kentucky, 25 percent; and West Virginia (predominantly nonunion), 20 percent. On the other hand, production in the union states declined, in Ohio by 12 percent and in Indiana and Illinois by 11 percent. In Pennsylvania, part union and part nonunion, production just about held its own.

"This increase in production in nonunion fields has been due to the high wage scale in the union fields, which has made it impossible for the latter to meet the competition of the former. It has meant the opening of many new mines in the nonunion fields and a net addition to the already excessive mine capacity of the country. To a lesser extent capacity has been increased by the efforts of union operators to meet nonunion competition through the more general use of labor-saving machinery.

"Another feature of the year's history has been the excessive seasonal fluctuation in output, a fluctuation greater than the industry ever experienced before except in time of strike. It seems, therefore, that the signing of the Jacksonville agreement, which was urged by many on the ground that it would stabilize the industry, has, on the contrary, added to the already inflated capacity of the country and has been at least partially responsible for the greatest seasonal fluctuation in its history. Incidentally, it has forced many operators into insolvency already and brought others to the verge of bankruptcy.

"The question of fundamental importance is whether the wage scale perpetuated by the Jacksonville agreement is a reasonable scale. For our answer to that question we do not have to depend entirely on the bald statement that $7.50 a day is an unreasonable wage for practically unskilled labor. We have further interesting evidence that the wage is unduly high.

"In the union state of Ohio, while production decreased 12 percent between 1920 and 1923, the number of men in the industry increased 7 percent; in both Indiana and Illinois the reduction in output was 11 percent, but the number of men in the industry increased 14 percent. Obviously the wage rate is high enough to attract men into an industry in which they know in advance that they will have much less than a full year's work.

"In Pennsylvania, part union and part nonunion, with practically stationary production, the number of men increased 12 percent, while in West Virginia, predominantly nonunion, production increased 20 percent and the number of men 14 percent. For the country as a whole, with a decline in production of 1 percent the number of men increased 7 percent, or by an aggregate of 63,000 men.

"In spite of all its troubles the industry continues to serve the country by furnishing it with an unlimited supply of bituminous coal with a mine price which cannot be matched by the product of the coal mining industry of any other country in the world. At the end of the year, with production running well over 10,500,000 tons a week, the price continued lower than at any time since 1916 until the present year. Advocates of federal intervention and supervision may well recognize the fact that whatever other advantages they can claim for such a policy, one inevitable result of it would be a higher price for bituminous coal."

Looking at the coal industry from a world standpoint, Charles P. White, Chief of the Coal Division of the United States Department of Commerce, says:

"The year 1924 witnessed a decided drop in the world's coal consumption, owing to the industrial depression which prevailed for the greater part of the year in most of the leading countries. The resulting decrease in coal production was evident in practically all of the producing countries, including the United States, where the output of bituminous coal was approximately 97,000,000 net tons, or 17 percent less than that of the previous year, and the anthracite production about 5,500,000 net tons, or approximately 6 percent below that of 1923.

"The movement of the coal produced in 1924 was carried out without difficulty by the ample transportation facilities of the country. The seasonal movement of bituminous coal to the Northwest, all-

rail and via Lakes, and the rail and tidewater movement to New England proceeded with normal dispatch, although in smaller volume than during the preceding year, owing to accumulation of stocks and lessened demand.

"The average price of bituminous coal at the mines showed a steady decline from the middle of February to the middle of July, after which time it recovered gradually to the end of October. In the first part of November the price receded slightly to a level which was maintained for the remainder of the year. The Coal Age reports showed the average spot price of bituminous coal f. o. b. the mines per net ton, which ranged from $2.20 on January 7 to $2.27 on February 11, gradually downward to $1.96 on July 14, upward to $2.12 on October 27, and stood at $2.07 at the end of December.

"The price of export coal (pool No. 1, Navy standard) f. o. b. vessel at Hampton Roads remained at a low level throughout the year, ranging from $4.60 in early January to $5.05 at the 1st of February, reached a low figure of $4.05 the first part of September, and was $4.20 at the 1st of December.

"Exports of bituminous coal during 1924, on the basis of figures for the first 11 months, declined approximately 20 percent from the previous year. This was due largely to the general decline in world coal consumption and to the recovery of production in the Ruhr. The principal decline in tonnage was in the shipments to Canada, a decrease of approximately one-fourth from the figures of the preceding year, and also in the shipments to Europe, which fell off nearly one-half.

"Since the year 1923 witnessed the shipment of considerable tonnage to Europe on account of the lack of production in the Ruhr fields, it is not a matter of surprise to American exporters that most of this tonnage has been regained in 1924 by the near-by fields of England and Germany. One notable exception to the loss of tonnage to European markets in 1924 was exemplified in our trade with Italy, to which market our coal exports increased in 1924 nearly 40 percent over the previous year. Decreased consumption in Canada in 1924 accounted for most of the tonnage lost in that market. Bituminous coal exports to the West Indies (except Cuba) increased approximately 30 percent over 1923, while shipments to Cuba declined about 15 percent.

"American exporters are justified in a feeling of encouragement over the situation which prevailed in the markets of South America during 1924, in which our tonnage was more than double that of the previous year. The principal increases were in the shipments to Brazil, amounting to about two and one-half times the tonnage of 1923; to Chile and Uruguay, about the same increase; to Peru, an increase of over 60 percent; and to Argentina, about 50 percent. Exports to Africa destinations indicate a slight increase over the previous year.

"The export movement of bituminous coal was fairly regular throughout the year, with a high figure of 1,631,804 long tons in July against a low figure of 962,232 in April and a monthly average of about 1,200,000 tons.

"On the basis of the figures for 11 months of 1924 the exports of anthracite during the year indicate a decrease of approximately 28 percent from the previous year. As is usual, practically all of this tonnage moved to Canadian destinations. In quantity the shipments ranged from a high figure of 362,118 long tons in October to a low figure of 245,076 tons in April, with a monthly average of about 290,000 tons.

"Ocean freight rates advanced in the early months of the year, and again in the fall months during the very large movement of export grain cargoes, but dropped in December to approximately the level of January 1.

"Imports of bituminous coal declined in 1924 to approximately one-fourth of the tonnage of the preceding year, while imports of anthracite fell off about 60 percent. The bituminous imports came chiefly from Canada, and the small tonnage of anthracite from Great Britain.

"Employment declined materially, owing to the decreased demand for coal, this condition being particularly prevalent in some of the districts in the central competitive field after the first quarter. There were no major disturbances in the relations between employers and employes in the producing fields during the year, and a three-year wage agreement with the bituminous miners of the union fields was effected in February. The anthracite miners continued under their contract with the operators which was made in September, 1923, and runs to August 31, 1925.

"Having a production capacity vastly in excess of the country's requirements, the bituminous mines have felt keenly the competitive conditions which prevailed throughout most of the year, on account of the light demand for their product. This has been the case particularly in some of the union fields whose coal was unable to meet the competition of coal from nonunion fields having a lower wage scale. Many mines have had to close down and many others to run on short time through the year. The inevitable elimination of surplus mines under this economic pressure and evidence of a movement toward consolidation of ownership are some of the trends appearing on the horizon at the end of 1924."

ROCK DUSTING

SUFFICIENT investigation and experimentation with rock dusting as a means of preventing explosions has led Dr. Geo. S. Rice of the U. S. Bureau of Mines, to advocate this method, plus generous watering. He believes that the combined methods of rock dusting and watering will prove highly satisfactory. In a recent statement Dr. Rice asserts:

"Rock dust distributed throughout a mine combines with the coal dust accumulations into a mixture that is nonexplosive and which therefore tends to prevent coal dust explosions. If coal dust is allowed to accumulate in a mine after rock dust has been applied, the proportion of coal dust gradually increases until the mixture finally again becomes explosive.

"One of the principal sources of coal dust is that made by the machines used in undercutting the coal. The best way to keep down dust from this source is to use a water spray on the cutter bar. Dust made in cutting the coal should also be loaded out or shoveled out before the coal is blasted down, so that it will not be thrown into the air and carried away, to be deposited elsewhere by the ventilating current. Another source of dust is that which sifts from leaky cars or is blown by the air currents from loaded and emptied cars in transit between the working face and the mine opening. Drenching the cars with a water spray while they are in transit is an effective and economical way to keep down the dust from this source. A third cause of dust is the pulverizing of lumps of coal which drop off the loaded cars, fall on the track, and are gradually reduced to dust by the continual passage of the tips. This can be partly well met by keeping the haulageways cleaned up, and refraining from 'building' up the coal so high that it falls off the cars when they are bumped in haulage.

"To sum up, preventing so far as is possible the making of coal dust at the working surface in a coal mine is essential in connection with the use of rock dust to prevent coal mining explosions, the Bureau of Mines considers. If the production of coal dust is kept down by the judicious use of water, rock dusting will not need to be done so frequently and the cost of keeping down the dust will be partly met by the saving in rock dusting."

Director Kerwin of the Department of Labor told the House Committee on Appropriations that the Conciliation Service of which he is director last year settled 27 strikes in the anthracite field of Pennsylvania affecting more than 45,000 miners, and also numerous strikes in bituminous mines.

OIL SHALE IN 1924

The Interest Of The Government In Developing An Oil Reserve—The Competition Of The Elko Plant, The Trumble Process For Distillation And The Sacramento Meeting Are The Outstanding Events Of The Year

VICTOR C. ALDERSON*

THE outstanding events of the year have been the active interest of the United States Government, through the needs of the Naval Department, for a dependable supply of oil; the completion and continuous operation of a commercial oil shale plant at Elko, the first in the United States; the pioneer distillation work of M. J. Trumble in making water-white gasoline from oil shale in one operation; the recognition of oil shale at the London Exposition; the oil shale conference at Sacramento, together with the working exhibit of the Colorado School of Mines, and the increasing world-wide interest in the subject, notably in England, Sweden, Esthonia, South Africa, Australia, and Tasmania.

EUROPE

GREAT BRITAIN

No better set of principles, in concise form, has been enumerated than those devised by Harald Nielsen, of London, as the Ten Commandments of Oil Shale:

I. From an economic point of view, the raw material must be treated in bulk.

II. Any desired reaction temperature must easily be attained and be kept with a minimum of variation.

III. Strict temperature control.

IV. Rapid and uniform treatment so as to obtain a maximum throughput.

V. Lowest possible distillation temperature in order to secure the products in the primary state and avoid secondary reaction.

VI. Absolute control of time duration in the various temperature zones.

VII. Countercurrent principles strictly adhered to, so that once an oil vapor has been evolved at a specific temperature it should not be brought into higher temperature zones.

VIII. Rapid removal of distillation products once they have been formed.

IX. The retort should be called upon to act only as an economical and efficient separator of solid, liquid, and gaseous products from any raw carbonaceous material, this being its primary function.

X. The treatment should aim at being continuous; continuous feeding, heating, and discharging.

No single commandment can with impunity be sinned against without affecting the efficiency unfavorably.

The Rt. Hon. Viscount Long, president of the Empire Mining and Metallurgical Congress, held last summer in London, in his opening address referred to oil shale as follows:

"But while the present oil production of the British Empire is comparatively small and no great oil fields have been discovered within our boundaries, there is still a very great potential source of oil within the empire in our shale deposits. Oil, like coal, is a wasting asset, though there is little doubt that for many years to come new discoveries will add to the area of the fields now known. But long before any real shortage of oil is felt we may be sure that the vast deposits of shale with which the empire is richly endowed will have been drawn upon to provide us with the fuel now so essential to industry.

"The shale oil industry is by no means merely a possibility of the future, for in Scotland shale has been mined and retorted for generations, and it is a matter of interest to recall that the modern petroleum industry owes its early development to the successful results of experiments in the refining of shale oil made in Scotland over half a century ago by Dr. James Young and his associates. Apart from these Scottish shales extensive deposits are known to exist in Norfolk, Dorset, and elsewhere in these islands. These English shales have presented certain difficulties, chiefly of a chemical nature, but one may assume that these difficulties will eventually be overcome. Elsewhere in the empire shale deposits of importance occur in different parts of Canada; and much attention is now being given to the question of shale exploitation in Australasia, especially in the island of Tasmania.

"Another potential source of oil supply is to be found in torbanite, a substance similar to shale but containing, it is claimed, a much larger proportion of the higher grade oil. New South Wales contains the richest torbanite known, the yield of which is said to be up to 130 gallons of crude oil to the ton. Important deposits also exist in other parts of Australia; in South Africa; in Nova Scotia; Canada, and even in Great Britain. The improvements now being made in retorting suggest an important future for these resources."

The two striking features of the Congress were, first, the demonstration by the Crozier retort. This retort was first designed to treat the Burma-Siam deposits and was so successful that it was exhibited in London. It is of the vertical, modified Scotch type, but designed for large output, low first cost, cheap operation, and the production of fractionated and partially fractionated products in one operation. The second feature of note was the comprehensive and exhaustive paper on the oil shale distillation by Edward M. Bailey, chemist of the Pumpherston plant, Scotland. Experimentation on the distillation of oil shale has gone on apace in England, stimulated by the domestic demand for a successful process for the low-temperature distillation of low-grade coal and lignite. Good work has been done in the development of the Freeman, Fusion, Turner, Lamplough-Harper, Ironside, and Nielsen retorts. The Fusion retort has been selected for installation in Esthonia. It is of the horizontal, rotary type, externally heated by gas. Within the retort free-moving tumblers crush and advance the shale, a device that pre-

Oil Shale Deposit on Conn Creek, Near De Beque, Colo.

* President, Colorado School of Mines.

vents coking, gumming, and sticking within the retort. The L and N rotary retort is the work of Harald Nielsen, a chemical engineer of wide experience in gas plant practice and high-temperature work. The retort is of the inclined, rotary, revolving type, internally heated. It is designed on correct scientific principles and has met the expectations of its sponsors.

The announcement by Dr. W. Forbes-Leslie, of London, of an extensive deposit of oil shale in Somerset, on the Bristol channel, hitherto unknown, caused a flutter of excitement in British circles. The discovery was widely heralded and the freedom of England from imported oil was freely predicted. Preliminary statements have been made to the effect that the vertical range of the oil shale strata is estimated at 1,000 feet, that the strata vary from 2 to 25 feet in thickness, and that nine thousand million tons of oil shale are available for treatment. H. G. Shatwell, A. W. Nash, and J. Ivon Graham, however, in a paper before the Institution of Petroleum Technologists, reported that six tests gave a maximum of only 10.12 gallons of oil to the ton. Borings, exhaustive sampling, and treatment in commercial-sized retorts are yet to be made before the deposits can be classed as commercially dependable.

Reports from Scotland state that Scottish Oils, Ltd., has had a troublesome year not from technical but from industrial conditions. Labor and supplies have been high, while the returns from the manufactured products have been low. However, the company paid the regular 3½ percent semiannual dividend on its preferred stock July 1, 1924. The company now operates 26 shale mines, 2 coal mines, 12 crude oil works, 5 refineries, 2 sulphuric acid works, and 1 candle factory. The employes number 10,000. A community of 40,000 is dependent upon its operations.

The University of Birmingham is awake not only to the necessity of training a personnel for the oil industry but also to the necessity of doing experimental work on the oil shales of Norfolk, Somerset, and Devonshire. All three deposits are of commercial size but contain such an excess of sulphur—from 5 to 8 percent—as to make the resulting oil unmarketable. The answer to the appeal for funds was most gratifying. The largest contributors were:

Sir Marcus Samson, Bert.....	£25,000
Lord Cowdray.....	25,000
Anglo-Persian Oil Co., Ltd.....	25,000
Anglo-Saxon Petroleum Co.....	25,000
D. Alves.....	12,500
Anglo-American Oil Co., Ltd...	10,000
	£122,500

or approximately $600,000.

Sweden

Sweden will soon be out of the international market for coal and oil. The pilot plant at Stockholm by Burgh and Larson was so successful that a commercial plant has been erected at Kinnekulle—the location of the richest and most accessible oil shale deposits in Sweden. This plant can produce annually 250,000,000 tons of crude oil at a cost which will enable it to be sold at less than the imported oil. Thus Sweden will soon be self-sustaining, as far as crude oil and its products are concerned. Other countries with local oil shale resources but little or no coal or well oil may be expected to do likewise as soon as they can.

Esthonia

The chief natural, undeveloped sources of wealth in Esthonia is oil shale. The industry dates from 1918 when the German occupational army left. The new Esthonian government at once took possession of the deposits and established the industry under government control. The attitude of the government in granting concessions to foreigners has been liberal. A group of Swedish financiers, backed by Swedish banks, have secured a lease on 4,000 hectares near Vaivara station. They propose to expend 60 million Swedish kronen in the enterprise, to erect five large retorting plants, to build their own harbor near Sillamae, and to build their own railroad from Sillamae to Vaivara. Extensive experimental work has been done to satisfy the backers of the enterprise. An English company has a lease on a tract at Vanamoisa and is erecting a retort made by Vickers, Ltd., of a daily capacity of 50 tons. Another concession has been granted to the Baltic States Syndicate, an English concern. Under the terms the government receives five percent royalty on all oil produced or 10 percent of the shale mined. After four years the minimum amount of shale to be mined annually is fixed at 180,000 tons; after seven years the amount is 300,000 tons. E. H. Cunningham-Craig of London, has reported favorably on the project and estimates a net profit of $5.00 a ton. Altogether 265,000 acres have been granted in concessions. Portland cement works consume most of the shale now being mined. In 1924 they used 112,000 tons. Half of the locomotives in Esthonia now use raw oil shale for fuel. Its use for general heating purposes is steadily increasing. Factories and large industrial enterprises required 100,000 tons in 1924. The excessive amount of ash is a detriment but this is being gradually overcome. The deposit extends southward, at a slight dip, from the shore of the Baltic sea. Great quantities lie virtually at the surface and can be mined with steam shovels. The amount easily minable is estimated at five thousand million tons. The production has increased from 9,800 tons in 1919 to 208,000 tons in 1923. The estimated production for 1924 is 400,000 tons. The chief governmental works are at Kothla on the very spot where a fierce battle was fought between the Esthonian army and the Russian Bolshevists. Now 1,500 men are employed. The plan and equipment comprises 21 locomotives, 600 dumping ore cars, and 66 houses, including dwellings, hospital, school, post office, bank, and stores. The cost of open cut mining of the oil shale is from 81 to 87 cents a ton exclusive of royalty and overhead expenses. Underground mining is expected to cost 20 percent more. Great progress in developing the industry has been made but the great problem of all is yet to be solved; that is, the development of a retort, simple in construction, of low initial cost, and fool proof in operation, that will produce a high grade of oil.

France

The oil shales of France are found in seven distinct basins or regions, viz: Aumance, Manosque, Frejus, Faymoreau, Vagnas, Vendes, and Autunois. The total available amount is estimated at 50,000,000 tons, more than half of which lies in the Autun basin. The first commercial unit of the new retorting plant of 200 tons daily capacity of the Var Oil and Coal company is now in successful operation.

Italy

Deposits of oil shale occur in Lombardy, Venetia, Sicily, Calabria, and Basicilata. An area of 500 acres is being worked in Sicily, between Ragusa and Syracuse. The bitumen product is used for asphalt paving. The oil produced is of good quality. The lubricating oils are sufficient for domestic use so that further importations will cease.

Switzerland

Ichthyol, under the trade name of Saurolo, is manufactured at Meride from the oil shale in that vicinity. Ichthyol, as a skin specific, has a wide use, is classified in the pharmacopeia among the sulfonated bituminous preparations and has been passed upon favorably by the American Medical Association. Saurolo is imported into the United States but is resold under various trade names by the distributors.

Spain

Little is heard of oil shale in Spain, yet at Puertollano, 110 miles south of Madrid, is a commercial plant that has been in successful operation for years The products have a local market and the project is a financial success. The main stratum is six feet in thickness and yields 30 gallons to the ton. The

retorting is patterned closely after the Scotch process of vertical, small capacity, slow acting retorts.

ASIA

JAPAN

The oil shale situation in Japan is peculiar, important, and highly instructive. The Japanese Navy requires 500,000 tons of oil annually; industrial needs amount to 300,000 tons. With the commercial expansion of the country a demand for a million tons a year will soon be made. The great Fushan coal deposits are overlaid, throughout their entire extent, by thick beds of oil shale. To get the coal the oil shale must be removed. The cost of mining the shale can be charged either to the cost of mining the coal or the total expense for both coal and shale can be apportioned. In either case the economic conditions are favorable for a successful oil shale mining. The financial plans involve an expenditure of $25,000,000, to extend over a period of years, contributed partly by the South Manchurian Railway and partly by the Japanese government. The shale bed is estimated to yield 1,900,000,000 barrels of oil or enough to meet the needs of the Navy for 300 years. Extensive experimental work has been done in Manchuria by Professor T. Kimmura followed by a commercial test of 500 tons at Pumpherston, Scotland. The results in both cases are reported to be satisfactory. The initial plant to be erected will have a daily throughput of 2,000 tons. The cost of installation is estimated as follows.

Distillation plant	$1,800,000
Refinery	750,000
Miscellaneous	450,000
	$3,000,000

Treatment costs are estimated as follows, per ton of shale:

Retorting	$0.71
Refining	0.92
Sulphate of ammonia	0.45
Disposal of residue	0.20
	$2.28

The market value of the products is estimated at $3.12 a ton. This leaves a gross profit of $0.84 a ton for a 2,000-ton plant. If allowance is made for depreciation and for the balance between mining costs and the value of the spent shale for filling in purposes the profit is estimated at 13 percent on the capital investment of $3,000,000. From this analysis of only one phase of Japan's economic life, it is easy to see that she is fully aware of the necessity of oil as a fuel not only for her navy but also for her industries.

BURMA-SIAM

Burma-Siam illustrates another case of high priced imported oil on the one side and a vast deposit of oil shale capable, if developed, of supplying all domestic needs. Burma-Siam is also to be recognized as the home of the Crozier retort, first applied to local oil shale, and last summer successfully operated at the London exposition. An oil shale area two miles long and a quarter of a mile wide has been core drilled and has proved up 13,500,000 tons of oil shale of an average yield of 33 gallons of crude oil to the ton. Of this amount, however, 7,500,000 tons yielded an average of 45 gallons of oil and 48 pounds of ammonium sulphate to the ton. The main bed is from 6 to 7 feet in thickness and therefore of workable, commercial size. However, poor transportation difficulties will impede early development of the industry. The production of oil from wells is not sufficient to supply the local demand. For this reason the deposits occupy a valuable strategic position. There is no quoted price for crude oil as the large producers of oil get the equivalent of three dollars a barrel for crude well oil. The shale oil of the Burma-Siam field requires more treatment than the well oil but the higher content of the more valuable fractions amply compensates for the difference in cost of treatment. The lubricating oils from crude shale oil are superior to those from well oil.

Oil Shale Deposit, Watson, Utah

AUSTRALIA

NEW SOUTH WALES

R. H. Cambago in his Presidential Address before the Royal Society of New South Wales, Australia, in June surveyed the oil shale situation in a comprehensive manner. He stated that 40,000,000 tons of crude shale oil could be expected from known deposits in New South Wales. Exceedingly rich shale mined near Hartley Vale yielded from 150 to 160 gallons of oil to the ton, but the average was from 75 to 120 gallons. The high price of crude oil in Australia has brought about renewed interest in securing oil from shale. The Prime Minister has been appealed to for government aid in exploring the deposits and subsidizing an operating company. Statements made show that in certain areas a yield of 2,500 tons of shale to the acre can be expected, and that a retorting plant of 300 tons throughput a day can supply 30,000 gallons of oil a day for 100 years. The delay in developing the oil shale industry in Australia has been the lack of high grade technical men to direct the work, no thorough investigation and test of the deposits themselves, and no retort adapted to the oil shale itself, as well as labor troubles. The Bronder (American) retort is now being tried out by the Australian Shale Oil Corporation, Ltd., at Wirths Park. The experimental plant produces 12 gallons of oil an hour. The oil shale treated was taken from the Murrundi deposit and yields 70 gallons of oil to the ton.

TASMANIA

Interest in developing the oil shale deposits of Tasmania has recently been actively aroused by the action of the government. Development of this primal source of wealth has been accentuated by the high price of imported oil and the recognition of the need of oil both as a fuel and as a lubricant. Hon. J. A. Lyon, Premier of Tasmania, called a conference of government officials, private owners, and operators to outline a plan of exploitation. He stated that the government would reserve to the state oil shale lands not now located by private interests but would grant concessions for development. One such concession to the Bronder Australian Shale Corporation was now under consideration. Oil shale

has been proved to underlie 300 square miles—from Latrobe on the north to Minrow and Quamby Bluff on the south (30 miles) and from the Don river to Rubison east and west (10 miles). Its value is estimated at $3,750,000. The Geological Survey estimates the available amount of shale at 43,000,000 tons of an average yield of 40 imperial gallons to the ton. The cost of mining and retorting was estimated at $2.00 a ton. With the active assistance of the government, added to the efforts of private interest, the development of this source of wealth may be confidently expected in the near future.

SOUTH AFRICA

Transvaal

The Ermelo district of the Transvaal is noted as having the richest single bed of oil bearing material in the world—known as torbanite. The area to be exploited covers 40 square miles and contains at least 25,000,000 tons, sufficient to supply the oil needs of South Africa for half a century. Dr. E. Neufeld, of Germany, found this torbanite to yield 97.3 gallons to the ton. E. H. Cunningham-Craig, in his report on this district said, "Considering the high prices of petrol and oil in South Africa and the great demand for these products, it is obvious that the mining and retorting of a torbanite, even in thin seams, will be a much more profitable business than mining coal." A recent test of torbanite by Professor Stanley gave 86.6 gallons to the ton. The gasoline produced was 20 percent of the crude oil, water white, and as good as any gasoline on the market. In order to find a suitable retort much experimental work has been done. The Lamplough-Harper retort, of a test size, has been erected and produced 150 gallons of oil to the ton. Its operation is reported to be satisfactory. A Griffith retort has been installed at Johannesburg and has been treating the rich Ermelo torbanite successfully. The retort is of the horizontal, revolving type, 13½ feet long, of which only 10½ feet is heating surface, and six inches in diameter. It treats 240 pounds an hour and yields oil at the rate of 75 gallons a ton. A special feature is a metallic brush within the retort which circulates the shale, scrapes the interior of the retort, and prevents caking. Low construction and operating costs, as well as adaptability to small units make this retort desirable for very high grade oil shale, like torbanite. In South Africa, as elsewhere, the economic demand for oil at a price below the cost of imported oil is the distinct force that is causing the development of oil shale.

CANADA

New Brunswick

Canada is a large importer of gasoline, kerosene, lubricating oils, and fertilizers. She faces the economic demand for a low price for these articles. The extensive deposits of oil shale not only in New Brunswick but in Nova Scotia and Newfoundland as well, if developed and utilized, will supply all her domestic needs. The D'Arcy Exploration Company, a subsidiary of the Anglo-Persian Oil Company, recently erected a retort of the Wallace type at Rosevale and operated it for nine months. Under the supervision of the technical experts of the company extensive mining was done over a large area from many out croppings and workings, and the resulting oil shale was retorted. Thus a thorough bit of prospecting was done. The average result showed 37 gallons of oil and 60 pounds of ammonium sulphate to the ton. On account of the high price of labor and supplies, the low cost of crude oil, and the flush production in California, it was decided to postpone the erection of a large commercial plant until the cost factor was reduced.

UNITED STATES

Great Western Field

Wyoming

The oil shales of Wyoming lie in the Green river formation, particularly in Sweetwater and Uintah counties, south of the Union Pacific Railroad, and extend to the Colorado line. Forty samples taken by the U. S. Geological Survey gave an average of 15.80 gallons of oil and six pounds of ammonium sulphate to the ton, from beds averaging four and a half feet in thickness. These figures seem unusually low as samples tested by the Wyoming Geological Survey show from 23 to 40 gallons of oil from beds of shale from 15 to 60 feet in thickness. Inasmuch as the oil shale deposits in Wyoming form a part of the great western oil shale field the general conditions of Wyoming apply to Colorado and Utah as well.

Utah

Salt Lake City, Utah, with an oil shale experimental station of the U. S. Bureau of Mines, is a center of oil shale interest. The Utah deposits form a part of the great western oil shale field and contain some of the richest oil yielding shale in this country. Naval Oil Shale Reserve No. 2, originally established in 1916, has been increased by 4,880 acres and now covers an area of 91,464 acres. This increase has come from the discovery that school lands granted to the state, provided they did not contain minerals, were found to be mineral bearing. The Utah deposits may be grouped as shown above with their approximate areas and yields as given by the Salt Lake Mining Review.

UTAH DEPOSITS

Field	Acreage	Thickness to yield 42 gallons	Production in barrels
Soldier Summitt	50,000	20 feet	2,178,000,000
Uintah Basin	125,000	40–60 feet	10,890,000,000
Watson and White River	50,000	30–50 feet	2,267,000,000
Naval Reserve	91,464	40 feet	8,016,040,000
Total in barrels			23,351,040,000

This possible yield of oil compares favorably with the yield from any other known field.

Colorado

According to the Colorado state immigration bureau, $5,000,000 is the total of expenditure, directly and indirectly, in Colorado that points to the development of the industry. The work done covers machinery, road making, camps, experimental retorts, mining operations, public and private experimental work. If the Government establishes an experimental plant, as is probable, on the Naval Reserve in Colorado a great impetus will be given to the industry, because the work done and the information obtained can be used advantageously throughout the entire great western oil shale field. The Government has withdrawn from entry, and added 23,000 acres to the oil shale Naval Reserve in Colorado. This action was taken primarily to increase the potential supply of oil for the use of the Navy and to give a wider range of operations in developing the acreage. The tract will be known as Oil Shale Reserve Number 3, is contiguous to Reserve Number 1, and lies in the vicinity of Rifle and Grand Valley, Colorado. These two reserves in Colorado are estimated to yield two and a half billion barrels of crude oil. The Naval Oil Shale reserve in Colorado covers 45,444 acres; in Utah, 91,464 acres or a total of 136,908 acres. If only 100,000 barrels are produced from each acre there is a potential supply of 13,199,200,000 barrels of oil. If loss is allowed for, this is more than the estimated amount remaining in all the oil pools of the United States and also more than has ever been produced from all the wells in the United States. All this is reserved for the use of the United States Navy alone. The first official recognition of oil shale by members of the Cabinet was given recently at a conference in Washington, arranged by Senator Lawrence C. Phipps of Colorado. There were present Secretaries Hoover, Work, and Wilbur, Rear Admiral Hilary P. Jones, Director George Otis Smith of the Geological Survey besides many other officials. Dr. Victor C. Alderson, President of the Colorado School of Mines was the prin-

cipal speaker. After the conference a practical demonstration, on a laboratory scale, was made under the direction of Dr. W. V. Norris. The raw shale was distilled into crude oil and gas. From the oil, gasoline was produced. Besides the working retort samples of the various products derived from the shale oil and samples of oil shale from foreign countries were also shown. The exhibit aroused keen interest and was visited by many Senators and Representatives. The purpose of the conference and the exhibit was to support Senator Phipps in the passage of an appropriation of $90,000 to erect a plant on the Naval Reserve in Colorado.

The Ventura Colorado Oil Company is planning to do its regular development work this year on its holdings at DeBeque, Colorado, and to investigate the problem of retorting oil from the shale. This will complete the company's title to 10,100 acres of oil shale land in the DeBeque district. The company has recently secured patent to the Gold Oil group of claims, comprising thirty-two claims or a total of 4,947 acres, in Roan Creek, 20 miles northwest of DeBeque, Colorado. The cash payment involved $12,370. The cost of mining and retorting is one of recurring interest. J. H. Ginet, from experience on his retort at DeBeque, estimates that the cost of mining will not exceed 90 cents a ton, the cost of crushing 6 cents, retorting 13 cents or a total cost of producing shale oil $1.09 a ton for shale yielding 60 gallons to the ton. He plans to be in full operation in May. If so, the Monarch plant will be the second oil shale plant to be put on a commercial basis in this country. A practical road test of the gasoline he has produced showed that 30 miles can be made in an automobile on a gallon of gasoline.

The Great Eastern Field

Ohio, Indiana, Kentucky

The deposits in Ohio, Indiana, and Kentucky comprise one extensive field, regardless of state boundaries. As a whole, this field yields less oil to the ton than the great western field of Colorado, Utah, and Wyoming. However, the loss in production per ton may be overcome by the superior advantages of cheap mining, excellent transportation facilities, abundant water, and nearness to all markets both for labor and supplies and for the sale of products.

Other States

Pennsylvania

The Pennsylvania Geological Survey has just issued a comprehensive report by Chas. R. Fettke, associate professor of geology and mineralogy at the Carnegie Institute of Technology, on the oil resources in coals and carbonaceous shales of Pennsylvania. Much of the work has been done on coals, although the oil shale deposits of the State are not neglected. Although these are much leaner than the oil shales of Colorado, and even of a grade lower than the shales of Kentucky, Ohio, and Indiana, exact information about them is desirable as they form a part of the available sources of oil for the future.

Oregon

A new oil shale deposit reported south of Bandon, 16 feet thick, is being tested to determine its commercial value but the chief activity in Oregon is the result of the work of E. W. Hartman. His company has secured a lease of 4,000 acres in Jackson county, 18 miles from Ashland, has erected a plant, and is proceeding to develop the area. The oil shale lies near the surface and can be mined with steam shovels. Details of the work were brought out by L. J. Taylor, of the company, at the Sacramento Oil Shale Conference and printed in the October issue of the Colorado School of Mines quarterly, copies of which may be had on request.

Nevada

The year 1924, the State of Nevada, and the name of R. M. Catlin mark an epoch in the advance of oil shale interests, in that they correlate the first commercially operated oil shale plant in the United States. During eight years of experimentation Mr. Catlin has tried out five different processes, each on a commercial scale. The present plant is the result. Little attention has been given to the by-products but stress has been laid on producing a good oil from which the main products, gasoline, lubricating oil, and wax could be produced in marketable form. The Catlin retort belongs to the vertical type and is characterized by large capacity, few movable parts, low first cost, small operating costs, and fool proof, simple operation. The retort is a circular vertical steel shell 40 feet high, 12 feet in diameter, lined with fire brick, and holds in one charge 80 tons of shale. The retort is divided into three horizontal sections or zones; from top to bottom designated as the distillation, fire, and ash zones. The shale, crushed to two inch size, is fed in at the top. Once charged and lighted the process is continuous. As fast as the oil and gas vapors are produced in the distillation, or topmost, zone the carbon residue drops to the middle or fire zone. This zone supplies, by circulating gas, the heat for distillation in the zone above. The combustion of the carbon is controlled by the amount of oxygen in the gas. The gases not only provide the necessary heat but also the flushing necessary to carry away the oil vapors formed in the combustion zone. The spent shale from the fire zone drops to the ash zone and is discharged. The oil vapors are removed through an outlet at the top and go to the condensing plant from which the uncondensable gases are piped back to the fire zone and burned to provide heat for distillation. The distillation of the shale, when once started by extraneous heat, supplies all the heat necessary for operating the plant. The refinery and other equipment follows ordinary commercial practice. The normal daily throughput is 100 tons but 144 tons have been treated. The products of the plant—gasoline, kerosene, fuel oil, and wax—have found a ready sale in competition with similar products from well oil. The lubricating oils have been found to be especially well adapted to automobile and aeroplane uses. The shale yields, on the average, 38 gallons to the ton. The cost of mining is approximately one dollar a ton. Other deposits of oil shale in Nevada are known but as yet are undeveloped; i.e., in Cottonwood Canyon, Churchill County; at Carlin, where a bed of 300 feet thickness is known; in Nye County, 10 miles east of Currant; in Washoe County in the Trukee beds of the Peavine district; in White Pine County, near Hamilton; also near Eureka. The oil shales of Nevada have never yet been thoroughly exploited but when they are they will contribute largely to the productive wealth of the state.

California

Activity in California during 1924 has been pronounced. The State Mining Bureau has published a survey of the oil shale in Santa Barbara County, by F. D. Gore, which shows that this deposit is of distinct commercial value. It is notable in that it occurs in an established well oil region and, unlike most true oil shales, contains an appreciable amount of crude oil that can be removed by solvents, such as benzol and chloroform. Geologically the oil shales occur in the lower series of the Monterey shales of the middle Miocene period. The series is very thick. In the Casmalia field oil wells have penetrated shale to a depth of 700 feet; in the Santa Maria fields, still deeper, to a depth of 2,000 feet. The immensity of the deposits is plainly descernible at the Shuman railroad cut, two miles north of the Casmalia, where a height of 300 feet of oil shale can be seen from the car windows. The N. T. U. Company has done extensive development and experimental work in this field by the opening of the deposit and the erection of a distillation plant. George W. Wallace, the engineer in charge, reported on the work done, at the Sacramento Conference. A full account of his report is contained in the October quarterly of the Colorado School of Mines. A report on the process has been made by Smith, Emery, and Company of San Francisco and Los Angeles. The work

of M. J. Trumble at Alhambra, California, marks distinct progress in producing oil and gasoline from shale. Up to the present time experimental work has been done in two separate fields; first, the retorting of the shale to produce oil; second, the refining of the oil. Experimenters have been confined to two classes. Their work has not overlapped. They were devoting their efforts either to producing oil or refining it—not to both. Mr. Trumble now enters the field with a plant that regards oil only as an intermediate product. In one operation he produces water white gasoline direct from the shale. By economy of operation, and conservation of heat he produces an excess of power that can be used for other purposes than operating the plant. The process is described in the July quarterly of the Colorado School of Mines. Additional information was submitted by Colonel Louis R. Ball at the Sacramento Conference and published in the October quarterly of the School.

Title

The resurvey of oil shale land in the DeBeque section is progressing. On account of inaccuracies and glaring errors in the earlier surveys, title to land, filed upon by locators, was very uncertain. A resurvey by the government with the assurance, without cost to the locators, that they would be granted title to the actual land located upon gave heart to the locators that they would not be dispossessed of the claims on which they had filed and on which they had done assessment work in good faith. Between 1920 and 1924 patents to 54,029.15 acres of oil shale land have been granted, through the office at Glenwood Springs, Colorado. Of these 8,623.19 acres were patented in 1924 alone. The number of acres pending for patent is now 21,565.26. A test case covering title to oil shale land has been decided in the case of George L. Summers, who filed on an original 320 acre homestead tract 20 miles north of Debeque. There was no outcropping of oil shale on his land but the inference from nearby ledges was that his land was underlaid by an oil shale stratum several hundred feet below the surface. For this reason his land was filed on by others as oil shale land. The question at issue was whether a discovery of oil shale on the land itself was necessary to determine its stratus as oil shale land or whether geological inference from adjacent lands was sufficient. The case was first tried at Glenwood, appealed to the commissioner of the General Land Office, and finally to the Secretary of the Interior. The decision of the Secretary upheld the original decision of the local officers that actual discovery of oil shale on the land in question is necessary. In the light of this decision land back of the escarpments, covered by hundreds of feet of soil and rock, can not be filed upon as oil shale land unless the actual oil shale is found to be in place; this can be done practically only by means of diamond drilling.

Economic Aspect

A few important facts are to be kept constantly in mind when considering oil shale on a large commercial scale. It is not a poor man's game, but a rich man's business. Operations must be conducted on a large scale. A million dollars or so must be spent before a single dollar is returned. A thousand tons of shale must be mined, crushed, retorted, and refined daily. The profit will depend on a small margin per ton magnified by a large tonnage. That small margin of profit may come from any one of several economies: e.g., cheapness of mining; convenient arrangement of plant buildings; simplicity of operation; dumping ground, and similar factors. The success of the enterprise may also depend upon the special value of one product like a superior product in lubricating oil, water white gasoline, a good grade of wax or ichthyol—the skin specific. The use of the fixed carbon in the spent shale may also be a source of profit in making producer gas. If there is a local supply of limestone there is the possibility of using the residue in the manufacture of bricks in which case an excess of gas could be profitably used as fuel. This feature has been developed in Scotland by the British Brick Company of Philipton, Linlithgow, where the Broxburn spent shale is used. The plant has a capacity of 24,000 bricks in 24 hours. Professor T. Hudson Beare, University of Edinburgh, has tested the bricks made and has reported that they are not only of a high quality but superior chemically and physically to the ordinary clay burned bricks.

The Critics

In spite of advances made the critics of oil shale are still busy. First, they decried it as unable ever to compete with well oil because well oil is manufactured by nature at no cost. Such was said of artificial ice when it was a laboratory curiosity, yet today artificial ice is manufactured even in the tropics and has a world-wide use, while natural ice is a curiosity. In the early days of the beet industry it was argued that Colorado could not raise sugar beets and compete with cane sugar from Cuba, yet today the beet sugar industry of Colorado is worth many million dollars to the state. The critics also see nothing in oil shale either for us or for our children; perhaps it would come into service for our grandchildren. The best informed oil men today are recognizing and admitting guardedly, to be sure, that the supply of well oil has passed its peak and that in a very few years a fresh source of oil must be sought. Thomas A. O'Donnell, President of the American Petroleum Institute, in his presidential address at Fort Worth, Texas, said:

"When the time comes that the American people have exhausted their cheap petroleum supplies, if that time ever comes, and no substitutes are found as cheap as we can produce our gasoline today, then we will go into the activity of producing substitutes and we will go into the Rocky Mountain range, which contains more petroleum for use of the people when wanted than all the petroleum we have yet produced, and more than some of our scientific gentlemen have given us credit for having to produce."

Did he refer to oil shale? The criticism, however, that seemed to give the critics the most satisfaction was the admitted fact that there was no plant in commercial operation. However, this last prop has been taken away by the work of R. M. Catlin, who now is operating his plant at Elko, Nevada, treating a hundred tons of oil shale a day and selling the products on the market. In a short time the critics will wish they could blot out the memory of their short sighted vision because the inevitable march of progress will surely demonstrate the narrowness of their failure to recognize industrial progress. The day when oil shale will be in active commercial demand is in the near future. Just when that day can be marked on the calendar is debatable. That oil from shale can be produced and put on the market now at a profit is well assured by the success of the Catlin plant. However, the great advance and the general acceptance of the fact depends upon the price of well oil. This price is the result of many factors in the petroleum industry. To arrive at a just conclusion several factors must be considered; e.g., statistics show that during the past 14 years production and consumption of petroleum have increased with great rapidity but that domestic production has not increased with the demand and the Mexican supply has been used to meet this shortage; the shortage for 1924 is likely to be 75,000,000 barrels; unless new gushers are tapped and new pools discovered, similar to those in the Los Angeles region—a condition possible but not probable—the price of petroleum, in spite of the amount now in storage, will advance rapidly. When it reaches an average price of $2.50 in the mid-continental field—and possibly $2.00—pronounced activity in the production of oil from shale will result.

Oil An Industrial Necessity

The necessity of oil in the industrial progress of the United States, and of the entire world, is admitted by all. Oil shale is but one factor in the oil prob-

lem. The production of oil, ready made by nature from wells, now absorbs great interest. Statistics of the oil industry may be juggled to prove any view. The steady decrease in production over long periods is used by one advocate; the discovery of the Los Angeles basin and the Wortham pool are used to show that new flush production can be found to bolster up the steady decrease in known fields. However, the one stubborn fact is that oil in the ground, like ore in a mine, is a wasting asset and that there is at some time, generally only a short time, a definite end to the supply. To far-seeing men the situation is approaching a stage so acute that remedial measures are being called for. The unscientific cut-throat methods of the oil operators, the enormous waste of the oil itself, and the "prince and pauper" condition of the oil industry, as a whole, have caused President Coolidge to appoint a high-grade Conservation Board consisting of Secretaries Work, Hoover, Weeks, and Wilbur to study the situation and to report remedial measures. The daily press seems alive to the situation and refers to it in strong language according to the *Literary Digest*. The *Louisville Courier Journal* says, "Our supply of petroleum is essential to the industry and greatness of the nation" and "waste has taken too large a toll and the time has come to call a halt." The *New York Journal of Commerce* says that the oil industry "operates at too great a rate of speed and with too large a margin of waste." The *Dayton News* fears that the oil reserve "is going to meet the fate of our natural gas supply unless steps are taken to avoid waste and plunder." The *Wall Street Journal* believes "this is the most important step the Government has taken to stop waste in the industry and revolutionize the present business methods of oil producers." All of which only emphasizes the need of an adequate and dependable source of oil, that is oil shale. To the average observer our supply of well oil comes from great gushers pouring forth thousands of barrels of oil a day. These are featured by newspaper headlines but their number is small and their life is short. A few fundamental facts will be informative. At the close of 1924 there was 290,100 producing wells in this country; their average daily production was only 6.6 barrels. The average in California was high, 75 barrels; Arkansas came next with an average of 46 barrels. At the other extreme the daily production was surprisingly low, viz:

	Bbls. ave. daily prod'n
Pennsylvania	0.30
Central and eastern Ohio	0.60
Northwestern Ohio	0.30
West Virginia	0.80
Illinois	1.30
Kentucky	1.70

To complicate the problem still more the demand for oil and its derivatives—gasoline and lubricating oils—is steadily increasing. The demand for gasoline is met to some extent by improved methods of refining the crude by which a larger percentage of gasoline is produced than ever before. However, this is but a temporary palliative. What is needed fundamentally is more crude oil.

Conclusion

As I review the progress in oil shale matters during the past year a few prominent features stand forth with great distinctness. These are the work of M. J. Trumble in California in producing water white gasoline in one operation; the success of R. M. Catlin in developing an oil shale plant on a commercial scale and marketing the products; the active interest of the United States Government; the industrial importance of producing oil from shale at a cost less than the cost of imported oil in such countries as France, Spain, England, Esthonia, Sweden, Australia, Tasmania, Brazil, and Japan; the need, in this country, of an increased daily oil production of 400,000 barrels in order to keep pace with the increased demand coupled with an absence of any relief except through the use of oil shale; and, finally, the generally admitted fact that there is more fuel, calculated in heating value, in the known oil shale deposits of the world than in all the coal, lignite, peat, and well oil deposits combined.

On December 29 and 30 the Metric Association convened in Washington, D. C. One object of the convention was the urging upon the attention of Congress the importance of metric legislation.

Oil Shale Mountain, Near De Beque, Colorado

OIL LEASE

A REVISED uniform type of oil and gas lease form applicable to all restricted allotted Indian lands has been approved by Secretary of the Interior.

The form is to take the place of three different forms heretofore used, one applicable to lands of members of the Five Civilized Tribes, one to lands allotted to Indians of the Kiowa Reservation, and the other a general form applicable to all other restricted allotted lands wherever situated.

The new form not only contains provisions more advantageous in many respects to the lessor and lessee but has been made to conform to the commercial oil and gas lease so far as the basic difference between the two forms will permit.

Printed copies of the new leasing form will be furnished superintendents of Indian agencies throughout the country in the near future with instructions to put in active use.

COAL MINE SAFETY CONFERENCE

PRESIDENT COOLIDGE expects to call a coal mine safety conference, to meet in Washington between April 1 and May 15. Governors of 24 coal-producing states will be invited to attend, and to bring with them such other persons as they may designate who can add suggestions to reduce accidents in coal mines. These representatives of the states may be state mine inspectors, coal operators or miners, or representatives of safety organizations. The conference is expected to continue for one week, the program to be developed by the Bureau of Mines. It is not the purpose of the conference to recommend additional legislation, either federal or state, but to develop a constructive program looking to coordination of safety officials and safety activity in the work of reducing mine accidents by applying known methods of prevention. The conference has been brewing for almost a year, when the matter was first taken up by the House Committee on Mines and Mining last spring. At that time it had been suggested that the conference be held in September, 1924, but on account of the state and federal elections the matter was deferred. It was again revived in November and the conference was tentatively slated to be held early in January. Because new Governors were taking office in that month the conference was again postponed until February 3. It then developed that many of the Governors could not leave their states because of the sessions of the legislatures. It has now been decided that the conference shall be held some time between April 1 and May 15.

LEGISLATIVE REVIEW

Capitol Is A Beehive Of Activity With Last Minute Rush To Clear Calendars—Mine Bills Are Receiving Attention, And Coal Regulation Again Flares Up

"How doth the busy bee
Improve each shining hour—"

THIS well-known couplet may be applied to Congress. In its desire to wind up legislation before March 4, the statesmen on Capitol Hill are emulating the example of the busy bee and are improving each hour by disposing of unfinished business in committees and on its calendars. In the case of some legislation, joint consideration is being given by Senate and House committees to expedite its enactment. There is a grand rush to pass as many bills of a minor, general and local character as possible, because March 4 will mean the death of all pending proposals. Night sessions are being resorted to by both houses of Congress and their committees to dispose of legislation. After all, Congress is human and, like individuals, is at times prone to put off affairs until the last moment and then rush things through. In one day the Senate passed more than 150 bills at one sitting, which indicates the speed and volume with which legislation is put through under pressure at the windup of a Congress.

Mining legislation is among measures which are receiving attention. The House Committee on Banking and currency has considered the bill of Senator Pittman, Democrat, Nevada, which passed the Senate last session and which directs the Treasury Department to purchase 14,000,000 ounces of silver at $1 per ounce, to complete purchases under the Pittman Act of 1918. The committee is expected to report the bill and press for its passage before the session ends. If enacted, the bill will have the effect of advancing the market price of silver to $1 per ounce during the time in which the purchases are made by the government. Although Seymour Parker Gilbert is now in Europe administering the Dawes reparation plan, his influence against this legislation still lingers. It was Mr. Gilbert who guided the Treasury's policy against this measure when he was Under Secretary of the Treasury, and his arguments are being used by his successor, G. B. Winston. Notwithstanding the Treasury's opposition, the bill is finding much favor in the House.

The session is being marked by a keen struggle of congressional commissions and committees of investigation to continue their existence during the new Congress beginning March 5 and extending for two years thereafter. These investigating bodies will end March 4 under congressional rules. Because of the decided disfavor to which congressional investigations have sunk as a result of the naval oil lease investigation, there has been a strong expression of feeling against authorizing further investigations during the new Congress, and proposals to continue the existence of certain investigating committees will be strongly resisted. This will apply particularly to the special tax committee and may adversely affect the Senate Gold and Silver Commission, which has been operating for two years.

Like Banquo's ghost, coal regulatory proposals will not down. When it had been thought that because of the quietude which had settled down on the coal industry there existed no reason for reviving the dry bones of coal regulation, the phantom reappeared in the form of a coal economics bureau. This suggestion was advanced by Senator Oddie, Republican, Nevada, chairman of the Senate Committee on Mines and Mining, in the form of an amendment to his bill creating a Department of Mines. Senator Oddie has combined in his bill practically every suggestion advanced by the Coal Commission for investigation and regulation of the coal industry. The bill calls for a multitude of investigations on every conceivable coal question. The Senator had no serious hope of its consideration at this session but presented the matter to develop views and discussion on the questions involved.

To mitigate some of the caustic charges developed by the naval oil investigation, the Republican Senators on the oil committee presented a report in which the leases were defended on the ground of conserving oil for government use and the position taken in connection with the leases by the Bureau of Mines commended. They took exception to the reflections which had been cast upon the technical staff of the Bureau of Mines, and strongly defended the high standing and experience of the officials of that Bureau. "There is no reason for the unwarranted slur upon the Bureau, which is one of the greatest and most efficient of the government," they said.

Legislation proposing to reorganize the government departments is being sought by congressional leaders upon request of the President, who believes that a regrouping of these federal agencies will result in economy and efficiency in the government service. These bills are slated to be considered before the session ends. They propose to transfer the Bureau of Mines from the Interior Department to the Commerce Department.

To check the unlawful mining and sale of coal on government coal lands, the House passed a bill providing penalties against coal trespassers. It is said that operations of coal trespassers are a serious menace to the local coal market, and that there is no existing law to meet the situation.

Another bill passed by the House requires lessees on

Philadelphia Inquirer

Another Message to Congress

IMPORTANT BILLS REVIEWED IN THIS ISSUE

MINING—
- S. 179: Oddie (R), Nev.—Coal Bureau.
- S. 3005: Ladd (R), N. D.—Potash Mining.
- H. R. 9029: Sinnott (R), Ore.—Potash Mining.
- H. R. 11077: Williamson (R), S. D.—Mine Claims.
- S. 3911: Ladd (R), N. D.—Mineral Exchange.
- S. 3666: Kendrick (D), Wyo.—Coal Lands.
- H. R. 6713: Sinnott (R), Ore.—Coal Trespass.
- S. Rept. 794, Pt. 3: Smoot (R), Utah.—Oil Leases.

COINAGE—
- H. J. Res. 318: Tague (D), Mass.—Silver Coinage.
- S. 3895: Greene (R), Vt.—Gold and Silver Coinage.

POWER—
- S. 3507: Underwood (D), Ala.—Muscle Shoals.
- S. Res. 286: Norris (R), Neb.—Power Inquiry.

COMMERCE—
- H. R. 11541: Peavey (R), Wis.—Great Lakes.
- H. R. 11254: O'Connor (D), La.—Waterways Commission.
- S. 3927: Butler (R), Mass.—Port Rates.

TARIFF—
- H. R. 11669: Andrew (R), Mass.—Flexible Duty.
- S. Res. 289: Robinson (D), Ark.—Tariff Commission.

potash lands to develop the entire tract of 2,560 acres instead of 640 acres.

New bills introduced propose to reserve minerals in exchanges of lands for forest lands.

Efforts are being made to secure action by the House and Senate on a bill already reported by the Military Committee for the conservation, production and exploitation of helium under the Interior Department.

Increased coinage of gold and silver is also proposed in new bills.

After debating the question for the first six weeks of the session, the Senate finally voted to authorize the lease of the Muscle Shoals nitrate and power project in Alabama. The measure adopted was drafted by Senator Underwood, Democrat, Alabama. Advocates of government operation of the plants met signal defeat. This measure goes back to the House, as that body had previously voted to lease the project to Henry Ford, who subsequently withdrew his bid.

Extension of the authority of the President to adjust tariff duties to equalize the cost of production in the United States and foreign countries is proposed in a bill recently presented. This measure would allow the President to take from or add to the free list such articles whose production costs vary between the United States and foreign countries. At present the law does not authorize additions to or removal from articles on the free list.

Advocates of a federal tax on present tax-exempt securities of the states have not given up their hope of finally putting through this legislation. Chairman Green, of the House Ways and Means Committee, proposed a constitutional amendment to levy this tax.

Extension of the immigration quota restriction to aliens from Canada, Mexico and South America was also proposed in a bill.

MINING

Coal Regulation

S. 179. Introduced by Mr. Oddie (Rep., Nev.). Referred to the Committee on Mines and Mining. This is in the form of an amendment to the Senator's bill creating a Department of Mines. It proposes to establish within that department a Bureau of Coal Economics, in charge of a director, which would conduct investigations in cooperation with advisory committees representing the anthracite and bituminous industries on coal problems with a view of stabilizing the industry. These investigations would cover production, transportation, distribution, marketing, storage, prices, costs, wage rates, employment, earnings of miners, living conditions and cost of living in mining communities, ownership and titles to coal mines and coal lands, organizations and persons connected with the coal industry, profits of mine operators and other individuals or associations concerned with the production, distribution or sale of coal, waste of coal, wage contracts, irregular production, general conditions under which coal is produced, causes of strikes, and other facts necessary to development of a sound public policy touching the coal industry.

The bureau is to invite cooperation of owners, operators, dealers and persons whose coal is produced and sold in intrastate commerce, and to cooperate with state and local officials in furnishing information respecting coal economics. Provision is made that in publication of reports and statistics no revelation of their source is to be allowed, so as to prevent injury to the business of persons furnishing the data. Access is to be given to the records of operators, dealers, etc., for confidential use by the bureau, which is also authorized to utilize information compiled by associations of operators and dealers and trade unions. If operators, dealers or other persons in the coal industry refuse to furnish information requested, the Interstate Commerce Commission would forbid the transportation of their coal in interstate commerce. Persons making false reports or removing data out of the jurisdiction of the United States to avoid federal orders or legal proceedings would be subject to a fine of $1,000 and six months imprisonment.

With the assistance of the anthracite and bituminous advisory committees, the Secretary of Mines would consider the following questions:

Coal Studies

Plans for the proper and adequate storage of coal by the consumer; supply and distribution of coal in times of emergency; equitable adjustment of royalty rates; taxation policies, particularly taxation of reserve coal lands; prevention of waste of coal in mining; improvements in underground management; removal of restrictions on output; free introduction of machinery into coal mines under safeguards that will protect the rights of employment; relief from irregular operation and overdevelopment; integration of the industry into larger productive units; improvements in the preparation of coal for market; training of mining engineers and foremen; prevention of accidents and accident compensation; improvement of housing, sanitation and living conditions in mining communities; improvements in the transportation of coal, including methods of mine rating and car distribution; elimination of needless cross hauls and long hauls; bulk handling at yards, terminals and ports; improvements in marketing, including standardization of contracts, inspection and grading; wholesale methods, retail costs and methods, and cooperative marketing and buying; promotion of the export coal trade; standardization and simplification of accounts and reports; development of trade statistics; constructive activities of coal trade associations; economy in the use of fuel and power through better combustion, electrification and improvements in gas and coke manufacture; increase in available supplies of household fuel; improvement in labor relations, including reduction of absenteeism and labor turnover; personnel management, improved machinery for the adjustment of grievances, and negotiation of wage

agreements; and such other possible improvements in the methods and practices of the mining, transportation, distribution and use of coal as will foster the growth and prosperity of the industry, the welfare of the mine workers and insure the public a constant supply of fuel at minimum prices.

Advisory Committees

Recommendations on these questions would be brought to the attention of the coal industry, the public, government departments and Congress.

The advisory committees would each be composed of three representatives of coal producers, consumers, miners in the anthracite and bituminous industries, and transportation agencies. The transportation representatives would meet with the committees only when transportation of coal is considered. They would not participate by discussion or otherwise in any matter involving directly or indirectly labor relations in the coal industry. The advisory committees would be named by the Secretary of Mines from among persons suggested by the interests represented, and be appointed by the President. Meetings of the committees would be held in Washington or elsewhere, and the Secretary of Mines would be the chairman. The Secretary may also organize advisory committees in the wholesale and retail trade. The members of these committees and persons invited to their meetings would be paid their expenses. Plans of the bureau for collection of information would be submitted to the advisory committees for their criticism and recommendation, as would also the nature and scope of the information to be collected by the bureau and the method of its collection and presentation. In case of disagreement the decision of the director would be final.

Within two years after passage of this bill the Secretary of Mines would investigate to develop a practical plan for the integration of the coal industry, through a consolidation of its larger producing units or through cooperative selling agreements, to the end that continuous and regular employment may be provided for coal miners, resulting in lowered cost of production and reduced prices.

Activities of the Departments of Commerce and Labor and Federal Trade Commission covering coal are transferred by the bill to the new bureau.

Coal Inspection

To insure proper quality of coal the measure authorizes establishment of a coal inspection service and requires operators, dealers, etc., to show the quality of coal on bills of lading. Operators, dealers, etc., may file with the Department a statement of standard of quality they are prepared to maintain in their shipments, and could not ship coal of lower quality. The Department would inspect, sample and analyze coal offered for sale to determine if it is of a quality equal to that specified in the certificate. If coal of a lower quality than certified is shipped the Department shall publish that fact and direct the shipper to modify the certificate of quality to conform to the average quality of the coal he is shipping. The Department is authorized to establish coal inspection and sampling stations for this purpose. It is also to arrange for inspection, sampling and analysis of coal for export and to issue certificates of origin and quality so as to promote the export coal trade.

The Secretary of Mines is authorized to initiate and conduct investigations concerning the efficient utilization of coal resources of the United States, both as to production and use, including utilization of fine sizes for domestic house-heating purposes and substitutes, including fuel oil; simplification of sizes of coal; degradation in size of coal through weathering and handling; and other necessary or desirable investigations covering the efficiency utilization of fuel resources.

In case of strike which threatens a coal shortage, the President is authorized to appoint a special investigator, who, however, shall not be connected with the Department of Mines. The service of the special investigator would terminate upon settlement of the strike. Within one year after passage of this act, the Secretary of Mines is to report to Congress a plan for emergency control of the distribution of coal during national shortages arising from any cause. This plan will provide for distribution of coal to consumers on the basis of their ascertained needs at reasonable prices. Should a coal shortage occur before this recommendation is made and enacted into law, the President is authorized to invoke the emergency fuel law of September 22, 1922, and appoint a Federal Fuel Distributor, who shall establish car service priority and prevent the sale of fuel at unreasonable prices. The Interstate Commerce Commission would immediately comply with recommendations of the Distributor.

Coal Trespass

H. R. 6713. Introduced by Mr. Sinnott (Rep., Ore.). Passed by the House. This bill proposes to define and punish trespassers on United States coal lands. At present there is no law on the subject. It is said that operations of coal trespassers are a serious menace to the local coal market where conducted, which legitimate operators would otherwise enjoy. The bill provides as follows:

"That it shall be unlawful to mine and remove coal of any character, whether anthracite, bituminous or lignite, from beds or deposits in lands of the United States, or in deposits or beds reserved to the United States, with the intent to appropriate, sell or dispose of the same, and every person who shall violate any of the provisions of this act shall be deemed guilty of misdemeanor and fined not more than $1,000 or imprisoned not more than one year, or both.

"Nothing in this act, however, shall interfere with any right or privilege conferred by existing laws of the United States."

Coal Lands.

S. 3666. Introduced by Mr. Kendrick (Dem., Wyo.). Reported by the Committee on Public Lands. It provides that lands of the United States in the Custer National Forest of Montana which have been withdrawn or classified as coal lands or are valuable for coal may be exchanged for other lands with a reservation to the United States of the coal therein and of the right to prospect for and mine the coal.

Potash Lands

S. 3005. Introduced by Mr. Ladd (Rep., N. Dak.). Reported by the Committee on Public Lands. This measure proposes to promote the mining of potash on public lands through prospecting permits extending two years for 2,560 acres. The bill would not apply to lands adjacent to Searles Lake, Calif., which may be operated or leased by the government. If prospectors develop valuable deposits they may be given a lease therefor at a royalty of not less than 2 percent of the quantity or gross value of the potash output. Lands which are known to contain valuable deposits shall be leased by the Interior Department in tracts of equal acreage at the same royalty upon payment of a rental of 25 cents per acre for the first year; 50 cents per acre for the second, third, fourth and fifth years; and $1 per acre per year thereafter.

H. R. 9029. Introduced by Mr. Sinnott (Rep., Ore.). Reported by the Committee on Public Lands. Passed by the House. This is similar to the foregoing.

H. R. 11077. Introduced by Mr. Williamson (Rep., S. Dak.). Referred to the Committee on Public Lands. It proposes to issue to South Dakota for park purposes certain lands in the Custer State Park now claimed under the United States general mining laws.

S. 3769. Introduced by Mr. Norbeck (Rep., S. Dak.). Referred to the Committee on Public Lands. This is similar to the foregoing.

Mineral Lands

S. 3911. Introduced by Mr. Ladd (Rep., N. Dak.). Referred to the Committee on Public Lands. This bill provides for exchange of mineral lands in forest re-

serves between the government and private parties and provides as follows:

"That either party to an exchange may make reservations of timber, minerals, or easements, the values of which shall be duly considered in determining the values of the exchanged lands. Where reservations are made in lands conveyed to the United States the right to enjoy them shall be subject to such reasonable conditions respecting ingress and egress and the use of the surface of the land as may be deemed necessary by the Secretary of Agriculture; where mineral reservations are made in lands conveyed by the United States it shall be so stipulated in the patents, and that any person who acquires the right to mine and remove the reserved deposits may enter and occupy so much of the surface as may be required for all purposes incident to the mining and removal of the minerals therefrom, and may mine and remove such minerals upon payment to the owner of the surface for damages caused to the land and improvements thereon: Provided, That all property rights, easements and benefits authorized by this section to be retained by or reserved to owners of lands conveyed to the United States shall be subject to the tax laws of the states where such lands are located."

H. R. 11500. Introduced by Mr. Sinnott (Rep., Ore.). Referred to the Committee on Public Lands. This is similar to the foregoing.

Helium

H. Res. 399. Introduced by Mr. Frothingham (Rep., Mass.). Referred to the Committee on Rules. This resolution asks for a special rule for consideration by the House of H. R. 5722, reported by the Military Committee, for the conservation, production and exploitation of helium under the Department of the Interior.

Oil Reserves

S. Rept. 794. Part 3. By Senators Smoot, Utah; Stanfield, Oregon; Bursum, New Mexico; Cameron, Arizona; and Spencer, Missouri (Republicans). This report defends the naval oil reserve leases, and particularly the part taken therein by the Bureau of Mines. It takes exception to the criticism of the bureau made by the report of Senator Walsh (Dem., Mont.), who charged that the technical men of the bureau are not chosen because of their skill or success in business. The Republican Senators say the bureau is competent and has competent men, and that there is no warrant to cast a slur on the bureau, whose men are of high standing and whose opinions are always sought. "There is no reason for the unwarranted slur upon the bureau, which is one of the greatest and most efficient of the government," the report says.

Oil Royalties

S. 1653. Passed by the Senate. It provides that receipts from bonuses and royalties on oil and gas lands in the Navajo Indian Reservation may be used by the Interior Department to meet expenses in connection with supervision of development and operation of the oil and gas industry on the reservation.

Oil Burners

Public Law No. 297. This law authorizes the conversion of four battleships from coal burners to oil burners. It authorizes the construction of additional naval vessels, in the procurement of armor for which the President is authorized, in his discretion, to make use of the armor plate plant at South Charleston, W. Va.

Coinage

H. J. Res. 318. Introduced by Mr. Tague (Dem., Mass.). Referred to the Committee on Library. This proposes to coin 300,000 50-cent silver pieces in commemoration of the one hundred and fiftieth anniversary of the Battle of Bunker Hill.

S. 3895. Introduced by Mr. Greene (Rep., Vt.) (by request). Referred to the Committee on Banking and Currency. It proposes to coin 20,000 one-dollar gold pieces and 15,000 silver 50-cent pieces in commemoration of the one hundred and fiftieth anniversary of the Battle of Bennington and the Independence of Vermont.

Muscle Shoals

S. 3507. Introduced by Mr. Underwood (Dem., Ala.). Passed by the Senate. This is a substitute for H. R. 518 and provides for lease of the Muscle Shoals, Ala., nitrate and power project. This and other proposals on the subject were debated for six weeks before the Underwood bill was finally passed. The measure now goes to conference with the House, as that body had previously voted to accept the Ford offer to lease the property. As Mr. Ford subsequently withdrew his offer, the Underwood bill will be the basis for the legislation.

Power Inquiry

S. Res. 286. Introduced by Mr. Norris (Rep., Nebr.). No committee reference. This proposes an investigation by the Federal Trade Commission of charges of the existence of a water power and electric monopoly.

Navigation

H. R. 11541. Introduced by Mr. Peavey (Rep., Wis.). Referred to the Committee on Interstate Commerce. It proposes to operate under the Inland Waterways Corporation a service by transportation lines on the Great Lakes. It appropriates $12,000,000, to increase the capital stock of the corporation which is fixed at $20,000,000, to carry out this service, which would be performed by vessels of the Shipping Board.

H. R. 11254. Introduced by Mr. O'Connor (Dem., La.). Referred to the Committee on Flood Control. It proposes to create a waterways commission of several members to coordinate government services and to study the development or control of waterways and water resources. The commission would report to Congress plans for this development. It appropriates $250,000.

H. R. 11309. Introduced by Mr. Lehlbach (Rep., N. J.). Referred to the Committee on Merchant Marine. This bill amends and supplements the Merchant Marine Act in order to promote foreign commerce.

S. 3836. Introduced by Mr. Jones (Rep., Wash.). Referred to the Committee on Commerce. This is similar to the foregoing.

S. 3927. Introduced by Mr. Butler (Rep., Mass.). Referred to the Committee on Interstate Commerce. It proposes to promote foreign commerce through all ports of the United States by preventing port differentials and other unwarranted rate handicaps.

H. R. 11704. Introduced by Mr. Garber (Rep., Okla.). Referred to the Committee on Interstate Commerce. This is similar to the foregoing.

Tariff

H. R. 11669. Introduced by Mr. Andrews (Rep., Mass.). Referred to the Committee on Ways and Means. This proposes to give the President authority to remove from or add to articles on the free list under the flexible provisions of the tariff law. At present no action on articles under the free list can be had under the flexible duty provision.

H. R. 11638. Introduced by Mr. Weller (Dem., N. Y.). Reported by the Committee on Judiciary. This bill proposes to change the name of the Board of United States General Appraisers to that of United States Customs Court.

S. 3979. Introduced by Mr. Copeland (Dem., N. Y.). Referred to the Committee on Judiciary. This is similar to the foregoing.

S. Res. 289. Introduced by Mr. Robinson (Dem., Ark.). No committee reference. This resolution calls for an investigation by the Senate Finance Committee of the work of the Tariff Commission under the flexible duty provision, and calls on the Commission for a report as to its activities thereunder.

H. R. 11076. Introduced by Mr. Knutson (Rep., Minn.). Referred to the Committee on Ways and Means. It proposes a duty of 100 percent ad valorem on granite.

Taxation

H. J. Res. 315. Introduced by Mr. Green (Rep., Iowa). Referred to the Committee on (*Continued on page* 96)

THE NATION'S VIEWPOINT

A Digest Of The Expressed Opinions Of Leaders In American Affairs

COOPERATION is the basis of all industrial progress. This thought was brought out forcibly by **President Coolidge** in a recent address before the National Council of Farm Cooperatives. In part Mr. Coolidge said:

"It has been announced solemnly and sepulchrally from the hollow depths of self-constituted oracles that Americans are not the sort of people who possess the genius for cooperation. To charge that any particular people lacks in capacity for cooperation is to charge that it has not been civilized. To allege that against the American people is to deny all of the obvious facts about our country. It is to reject all the manifest truths of everyday experience. America has accepted and adopted cooperation far in excess of any other nation.

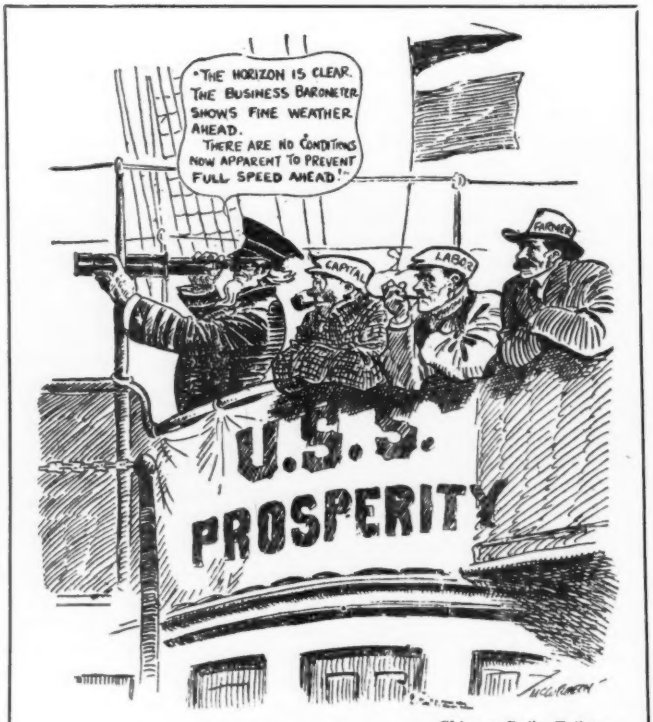
"Cooperative marketing will not work miracles. We want cooperation preached as a principle, and not as a panacea. It will not perform miracles. It will not accomplish the impossible but it is a sound, tried, demonstrated principle. It demands that the individual shall surrender some of his complete independence for his own and general good. It means that a certain authority must be delegated and when delegated must be supported. The country needs a genus of people trained to cooperate; and to get that it needs able, courageous, determined leadership, and most of all a leadership that will not desert."

There appears to be a general feeling that methods of taxation will regulate the measure of 1925 prosperity. Secretary of the Treasury **Andrew W. Mellon** in a recent address emphasized the necessity for taking politics out of tax legislation, saying:

"Taxation should not be used as a field for socialistic experiment or as a club to petty success, but as a means of raising revenue to support the government. The controlling elements are not political. The problem before us now is not so much one of tax reduction as of tax reform. The attention of Congress should be directed principally to the excessive surtax rate and the confiscatory estate tax rate. The gift tax is unworkable and unduly hampers legitimate business. The publicity provision in the Revenue Law is a mistake of policy and will be detrimental to revenue. There is conflict between the states themselves on the estate taxes. It is quite possible under our complex system of property ownership for the various states nad the Federal Government to take by death taxes more than 100 percent of a particular estate. The elimination of this manifest injustice will require the working out of some reciprocal exercise of the taxing powers by the states and the Federal Government in the interest of the good of the whole."

Carrying Mr. Mellon's idea still further, **Mr. Madden,** *"the gentleman from Illinois,"* advocates a return of any surplus to the taxpayer. Mr. Madden in a speech on the floor of the House, said:

"I would like to see some permanent law placed on the statute books of the country providing for an automatic return to the taxpayer of a reasonable surplus over the working balance whenever that surplus may accrue. I have an idea which I would like to outline. It is to this effect: That we might properly pass an act which would not interfere with any other tax legislation that might be thought proper, requiring the Secretary of the Treasury at the end of each fiscal year to report to the President of the United States the amount of the surplus, whatever it might be, if any, over and above a safe working balance, and then after the receipt of that report from the Secretary of the Treasury the President should be required to direct the Secretary automatically to return to the taxpayers whatever their proportion of the surplus might be, without any further application of law. That seems to me a sensible business proposition that would be inaugurated in any man's business if he was controlling the business entirely himself. I see no reason why the Government of the United States should not be conducted on as wise principles as that of any business in the land. Whether we have further tax reduction depends in a large measure upon members of Congress. The running expenses of the Government cannot be much further reduced. There is little prospect for further decrease in the cost of


"THE HORIZON IS CLEAR. THE BUSINESS BAROMETER SHOWS FINE WEATHER AHEAD. THERE ARE NO CONDITIONS NOW APPARENT TO PREVENT FULL SPEED AHEAD!"
CAPITAL
LABOR
FARMER
U.S.S. PROSPERITY

Chicago Daily Tribune

Full Steam Ahead

government. With the prospect before us of industrial and commercial prosperity we should have a good realization in revenue from internal and customs taxes. The hope for the future lies in not taking on new federal activities or enacting legislation which will greatly increase the cost of government."

The enormous increase in the cost of government and the attendant increase in taxation was called to the attention of the Senate in a recent address by **Mr. Bruce**, *"the gentleman from Maryland,"* in which he asserted that:

"The general expenses of the government have gone up within the last ten years from a billion dollars to upwards of three billion dollars. It seems to me peculiarly incumbent upon the voters of this country to change that situation. If any member of Congress is faithless to his constituent's interest, is unwilling to relieve him of the burden of taxation by proper reduction in national or state or local expenditures, all the voter has to do is to exercise his political power and to insist that that burden shall be reduced, that the government shall be more frugal, shall be more economical, shall be more efficient, shall not be weighted down as it now is by bureaucratic creations of one sort or another, or by the results of one set of wasteful paternalistic ideas or another. It seems to me that there is no reason why a counter-administrative process should not be set up and why, instead of the expenses of the government mounting to upwards of three billion dollars a year, they should not be reduced to two billions dollars a year, or one billion dollars a year. So, without any fear of successful contradiction, I say that so far as the reduction of taxes is concerned, that can only be brought about by political means, by the exercise of political power, by political insistence.

Among the more popular of the subjects for discussion during the month has been that of our foreign debts. Mr. **Charles E. Mitchell**, president of the National City Bank of New York, in a recent article on "Sound Principles For Dealing With Our Foreign Debts," emphasizes the necessity for the burden being borne by the present generation, saying:

Those Partial Eclipses — *Chicago News*

"The first principle is that the yoke of the war debt shall not be held as a burden upon the people beyond the generation that had to do with the war. This principle is not thus definitely stated in the Dawes plan and could not be because of the limitations under which the committee functioned, but it is clearly intimated in the fact that the industrial and railway debentures which form the principal security and means of payment of the debt carry 5 percent interest with 1 percent amortization, which means that such obligations are to be over a period of thirty-six years. Any attempt to force the carrying of such debt burdens to the second or third generations is but an engraved invitation to further trouble.

"The second principle is that the debtor country shall be taxed to the limit while the debt remains, but in no event to a point where its economic structure collapses under the strain; and, further, that the Nationals of the debtor country shall in no case have a lesser burden of taxation upon them than the Nationals of the creditor country—another principle the soundness of which can not be questioned.

"The third principle is that with such taxes collected, payments therefrom shall be made to the creditor country to such an extent only as they can be made without disrupting international exchange and commerce.

"These I regard as the fundamental principles of the Dawes plan, and all of the hundreds of pages of the so-called Dawes report are devoted to setting up the machinery by which these principles can be put into effect.

"In the adjustment of our foreign relations, essential to the development of increased export and import trade, there can be no problem of greater importance than reaching a sound and final conclusion as to this irritating question of the debts of allied countries to ourselves. Conditions in our own country are ripe for a period of prosperity which trends in Europe cannot immediately harm. We have emerged from what in reality has been a deep business depression."

"No, Ma'am!" — *N. Y. Evening Post*

In a signed article **Huston Thompson**, chairman of the Federal Trade Commission, attempts to answer the pertinent question of, "When is a debtor not a debtor?" by asserting when the debtor is a federal, state or local government. Mr. Thompson points out:

"It is a paradox of public finance that when a government borrows money from its citizens through bond issues its method of repaying the debt is to secure more money from its citizens in the shape of increased taxes. As a corollary to and in a large measure resulting from the increases in public indebtedness in the past 10 years, the Federal Trade Commission's report shows an increase of 127 percent in the aggregate tax burden for national, state and local purposes, from about three and one-half billions in 1917 to more than seven and three-fourths billions in 1922.

"Those who believe in decentralization and local administration of government will be interested in the fact that only one-eighth of the total tax burden in 1917 and one-ninth in 1922 were for state purposes. Nearly three-fifths of all taxes collected in 1917, and slightly more than two-fifths in 1922, were for local purposes. These increases in taxation and the heavy burden which they impose upon industry and the prosperity of the nation represent only in part the requirement for the necessary current cost of government. In almost equal parts they represent the cost of the upkeep of the public debt. Of the total income from taxation in 1923, $1,458,000,000 were spent for interest and retirement charges on public debt. This means that nearly 40 percent of the total ordinary governmental expenditure in that year was for the upkeep of the debt as against a little more than 3 percent in 1916.

"The sins of the rich are said to be many. They have been vociferously accused of putting their money into tax-exempt government bonds. The report of the Federal Trade Commission shows on the basis of estimate that of the thirty-two billion dollars of tax-free securities, federal, state and local, nearly twelve billions were in the hands of business corporations in 1922 and nearly five billions in the hands of individuals with taxable incomes of more than $10,000 a year. This means that nearly one-half of the tax-exempt securities was in the possession of individuals with incomes of less than $10,000 a year. Of the total thirty-two billions of tax-exempt securities issued and outstanding on December 31, 1922, nearly twelve billion were wholly tax free, while more than twenty billion were free of the ordinary income tax but subject to the surtax on the larger incomes. Of the wholly tax-free obligations, 2,294,000,000 were issued by the Federal Government and 8,797,000,000 by state and local government.

"The safeguard of the taxpayer against public extravagance depends upon whether he insists upon shouldering each ordinary public expense as it is incurred or whether he will permit himself to be drugged with a public bond issue which postpones the pain but aggravates it eventually or visits it upon the children of the third and fourth generations."

Philadelphia Evening Public Ledger

The Pest

The copper industry, which has been at ebbtide for many months, succeeded during 1924 to bring production back to its pre-war level, and there is optimism as to its possibilities for 1925. **Charles Hayden**, of Hayden, Stone & Company, in a recent statement to the press on the copper situation, said:

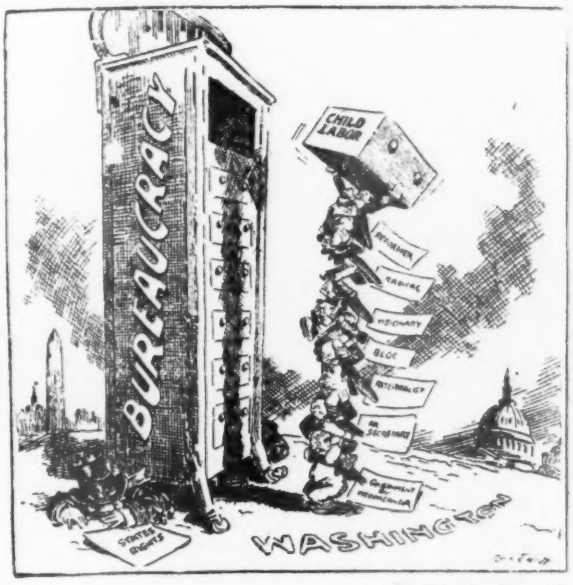
"Copper at the close of 1924 was higher than at any time since August, 1923, and this reflection of a healthy demand indicates that still higher levels are in prospect for 1925. Like the steel market, prices were at their lowest in the summer months when there was a let-up, partly due to seasonal variations and partly to the general uncertainty then existing over the outcome of the election.

"Copper at the beginning of 1924, f. o. b. refinery, sold at 12.625 cents a pound. The average for the first 11 months was 12.91 cents and now the price is close to 15 cents.

"Conditions in 1924, despite the fact that prices failed to advance sharply, showed steady improvement over previous years. American consumption exceeded production, thereby reducing stocks to a level where there is now about one month's supply ahead. Unless production is unduly increased during the coming year, which the lessons of the past should prevent, there is every indication that well-managed companies will enjoy reasonable prosperity during the coming year.

"Copper holds a unique position in the markets of the world in that 80 percent of the total production is either concentrated or controlled in this country, with a steady, constant international demand for it. Unlike many or most of this country's commodities, it is not dependent on the home market, 40 percent of the production going abroad.

"America is taking 59 percent and Europe 41 percent of the current American refinery production, which compares with 41 percent for American and 59 percent for Europe in 1913. The American demand has been most satisfactory. The European demand has been controlled by the same conditions as have prevailed during the last six years, but these conditions are now steadily and surely getting back to normal. The relative value of the currencies of the foreign countries has a great influence on their buying power. When the mark was fluctuating so widely and always downward from day to day, the German buyers were much more interested in its value than in the price this country was demanding for the copper. They were buying of us in dollars and selling their mill product in marks. Notwithstanding that well-nigh impossible condition in doing business, they have taken this year at least 140,000 net tons, in spite of the acute shortage of gold money in Germany. Now that the mark is established on a gold basis, the prediction is made that Germany will take 33 1/3 percent more next year than this year.



The Columbus Dispatch

Another Drawer for the Bureau

Columbus Dispatch

The Waiter's Check

"At the beginning of the year sterling was selling at $4.29 to the pound, now it is $4.70. As it is customary to sell to England in sterling, this very great improvement in its market value not only denotes greatly improved industrial conditions there but has contributed largely to the recent advance in the price of metal."

Prominent mining men have been emphasizing the fact that it is necessary to get behind the industry both for stimulation and stabilization purposes. **Miles Carpenter,** a prominent mining engineer at Tucson, Ariz., recently made a strong plea to have the business public get behind the mining industry. Mr. Carpenter pointed out:

"The mining industry in general and in Arizona in particular is just emerging from the deepest depression any industry could suffer. We must recognize first of all that the mining industry has changed entirely with the passing years. It is not a case of searching the hills for a rich strike. The entire mining region of the West has been combed by keen-eyed prospectors and if anything was overlooked you may be sure it was an accident. With the rapid depletion of the richer metallic ores which has been going on steadily for the past 50 years, new methods, machines and processes have been devised for working the lower grades at a profit. In spite of the rise in commodity prices and hence of the cost of items consumed in mining operation, this lowering of the grade of ore mined seems a progressive progress to which no limit can be set. The limit is whittled down to a fine point, but it gets continually finer."

There is a growing tendency for decentralization in government. In a recent discussion of the appropriation-bills, **Mr. Summers,** *"the gentleman from Texas,"* emphasized this necessity and said:

"We have concentrated at Washington a total of governmental responsibilities which is beyond human capacity intelligently and efficiently to deal with. As these additional powers come up from the states it is not humanly possible to handle them through the machinery of the Federal Government functioning under popular control. As these powers come up to Congress we shunt them out to a bureau, because the machinery of the Federal Government is absolutely overloaded. These bureaus have an aggregate of power that is appalling. We give to these bureaus the power to make rules, the power to construe their rules and the power to enforce their rules. All three powers of government concentrated in an irresponsible personnel; that is, I mean that they are not directly answerable to the people. We have the paraphernalia for popular government, and though in theory we have these bureaus that are agencies of popular government, the truth of it is that we have these bureaus which are becoming more and more the actual, the unsupervised governors of the people. Written constitutions can never hold within themselves an element of cohesive strength in government; they can only help hold territorial units and people together until they grow together at the point of contact. That development has already come about and now we have reached the situation where we must begin an intelligent decentralization of governmental power and responsibility. All true progress in government must be in that direction which puts the power to govern and the responsibility to govern close to the people. We must send responsibilities back to the people in order that through the grapple with the problems incident to self-government their governmental capacity may keep pace with the increase in the difficulties of government. It is not the right of the people to govern which is the important thing to preserve; it is the necessity to govern which is of transcendent importance."

Much of the discussion on the Muscle Shoals bill, which has been pending before Congress, has been on the question of government or private ownership. **Mr. Bruce,** *"the gentleman from Maryland,"* in a recent address on the floor of the Senate, made the following interesting comment:

"The Government has no right to enter into competition with its own citizens in any ordinary industrial line of business. I regard the proposition to establish a commercial fertilizer factory at Muscle Shoals as the longest stride that has ever been taken in its history towards the general socialization of industries of all sorts in the United States. We find the Govern-

ment sustaining other business and industrial relations but almost always back of the relationship there has been some special motive originating in the real necessities of the Government. You can run down every instance and you will find that that is all but invariably true. But here is nothing less than a bare, undisguised proposal to have the Government enter into competition with its own citizens in a field which should be left to private enterprise. The people seem to have arrived at the conception of the Government as a great wet nurse. I sometimes think that we should tear down the Statue of Liberty from the summit of this Capitol and place a big black pap bottle in its place. The idea seems to be that the Government is something to which resort is to be incessantly had for the coddling and artificial stimulation of private interests.

"I am opposed to the further material centralization of federal power, and, if I were not opposed to it for any other reason, I should be opposed to it because of the overwhelming disaster which overtook the Democratic party at the last election. What I have been saying points to the real cause of that defeat. There must be a reversion to the sound ideas of the proper relation between the state and the National Government and between government activity and private industrial activity."

As further showing the trend of congressional discussion on government ownership and regulation of industry, **Mr. Fess,** "*the gentleman from Ohio,*" in a speech on the floor of the Senate, said:

"I am not opposed to proper governmental regulation. The facts are that the Government does regulate industry. The Government in some respects controls certain industries. I have never been opposed to legitimate regulation. On the other hand, I recognize that the normal tendency of modern industry is to augment its power, to increase its dimensions. It naturally reaches out into the realm of the power that it exercises over the public in supplying the needs of the public, and from that very inherent quality government regulation may be necessary.

"When the Interstate Commerce Commission was created and began to function, we noted that as the transportation interests increased the powers of the Commission also necessarily increased; and from time to time the Government amended the law creating the Commission, never taking any power away from it, but constantly increasing its power, which was inevitable as a policy of government regulation. So today the Commission goes to the extent even of regulating rates, which is the very lifeblood of any enterprise; for when you take away the power to determine what the income shall be, you have largely struck at the very heart of the prosperity of that industry. I mention this simply to indicate that there is a cult going through the country trying to promulgate the idea that the Government ought to take over various industries, including such as transportation. The next step will be the nationalization of mines and ultimately all public utilities.

Cleveland Plain Dealer

A Bit of His Own Cooking

"I am opposed to such a policy. I am not opposed to governmental regulation, but I am opposed to governmental strangulation, and I am opposed also to government operation wherever the business can be conducted as private enterprise. To me, there is one great danger in government operation and that is especially the loss of initiative which is individual, not political. I want American initiative open. I want America to remain the open door of opportunity. I want every boy and girl, every man and woman to realize that America is the place of equal opportunity in the rivalry of life, and it makes no difference whether they come from a family of wealth or from a family of poverty. In this country, against which we now and then hear utterances such as a few moments ago, the laborer of today is the employer of tomorrow, and the one great incentive that drives on to success in America is the absolute certainty that with reasonable frugality and industry as against indolence and extravagance every man and every woman who is willing to pay the price can look forward to the time when he will not only become the owner of a home but can be reasonably sure to be the director of a business. That leads to initiative in industry."

The necessity for private initiative in industry was urged by **Mr. Lineberger,** "*the gentleman from California,*" in recent comment on the floor of the House, when he said:

"The American people are against socialistic panaceas. They are against the crushing and penalizing of American initiative which has made us a great people. This is a country where private initiative, private capital and private operation in the fields of industry, especially those like the mining industry, requiring initiative and daring, have achieved results that have never been approached in any other nation in the world. Let us continue to develop the resources of our magnificent country in the good old American way."

Mr. Reed, "*the gentleman from Missouri,*" also emphasized the necessity for government keeping out of business in competition with its citizens, saying:

"I do not believe in the proposition of government entering business. There are certain enterprises that can be run by the public better than they can be run by private citizens. I think the true line of demarcation is this, that the Government ought not to thrust itself into ordinary business enterprises."

Leaders in American industry have expressed the utmost confidence in the outlook for a prosperous 1925. This is particularly true as applied to the mining industry. **Judge Elbert H. Gary,** chairman of the board of directors of the United States Steel Corporation, in a recent interview, said:

"If the policies of the present administration shall continue in force and practice, and the American Congress is reasonably disposed to coop-

erate with the President, and the business interests of this country will likewise be disposed to support the administration in its efforts to assist the business of the country, the year 1925 should show the highest and most satisfactory prosperity in the whole history of the United States.

"The business of the manufacturers of the iron and steel industry of the United States during the year 1924, up to the date of election, was rather dull and depressed. It was good at the beginning, but with the commencement of March materially receded in volume. Commencing with June the volume gradually increased, but the selling prices were lower. Consequently, with some exceptions the profits of the iron and steel business for the first 11 months of the year, on the average, were small, and in many cases there were losses. As shown by the published reports, the Steel Corporation was an exception and obtained considerable net profits, though they were small, considering the capital investment.

"However, as predicted by some of us, the election of the Republican national candidates has had a marked effect upon the steel industry. Almost immediately after our elections the demand in this country began to show improvement in volume, and this condition to some extent had a favorable influence on some foreign countries. At present the demand for the iron and steel products manufactured in the United States is large, persistent and satisfactory.

"The new year will probably commence with all of the manufacturing plants operating at full capacity. Also selling prices have advanced to a considerable extent and should afford reasonable profits sufficient to continue the wage rates at the present standard. These were not reduced during the depression, notwithstanding they were not justified by the results of business."

The outlook for the relation between capital and labor for 1925 is very forcibly expressed by **Mr. Eugene G. Grace**, president of the Bethlehem Steel Corporation, in a recent statement by him to the press:

"During the past few months there have been important expressions in various parts of the world of confidence in the rightness of existing institutions.

"These recent public mandates as expressed by votes, especially in this country and in England, have given business men confidence in the future. They feel now that they may proceed with programs of expansion and development. Coming after several years of restricted business which the various industries have used to put their houses in order, this renewed confidence portends a period of sound business development.

"In this program of development competition will force attention to every detail of management, but I feel that more and more attention will be paid to that phase of management which deals with the human side of industry. Employers realize that without the confidence of their employes their companies cannot make the progress they desire. Employers in the future will take greater pains to see that their men are receiving proper treatment, as well as to see that there is made known to the men a proper understanding of the principles of business which concern the men in their relations with their employers.

"Furthermore, competition in this country and abroad will encourage work toward greater production from existing facilities and existing personnel, with the resulting lower unit costs of production. There is room for great development in the science of distribution of almost every commodity. One of the great problems of civilization is to make men happy. The problem of the distribution of the results of science and of human effort, the problem of distributing nature's bounty to all men in all countries, to the ultimate increase of their happiness, is the supreme problem that presents itself to the present and coming generations of mankind.

"With increasing interest on the part of workers in their jobs, with lower unit costs of production and lower costs of distribution, there is every reason to expect prosperity."

The Commercial Appeal

Who'll Get the Short End?

With state legislatures in session, the question of the Child Labor Amendment to the Constitution comes up for ratification. In a recent issue of the Manufacturers' Record, former United States Senator **Lawrence Y. Sherman** says:

"The proposed Child Labor Amendment substitutes the Government for the family. It is an unwarranted extension of the interference of government into the private affairs of the family. It is the first and a long step toward taking over the child by the Government. It is approved by every socialist. No believer in the domestic relation or the American family can support it. If there are some cases of irresponsible parents who overwork and abuse child life, they can and ought to be reached by the state. That jurisdiction ought to remain there. The 48 states are the broad foundation of Federal Government. Every subtraction of power to center it in a Washington bureau weakens the state and narrows the local theater for training the people in self-government. This amendment forges the strongest instrument in centralized power usurped from the states and placed in distant hands over the most vital relations of human life since the formation of the Government."

The West Virginia legislature is in session. **Gov. E. F. Morgan**, in his message to that body, had the following to say on the ratification of the Child Labor Amendment:

(*Continued on page* 96)

STANDARDIZING UNDERGROUND HAULAGE EQUIPMENT

Character Of Ground, Size And Character Of Ore Bodies, Tonnage And Distance To Be Moved, Must Be Carefully Considered In Their Relation To Present Mining Practice, Before A Standard Can Be Evolved

By W. V. De Camp*

IN attempting to standardize underground haulage equipment, one must not lose sight of the necessity in many cases of fitting the equipment to present conditions that may be the result of mining practice, which in turn is frequently controlled by character of ground, size and character of ore bodies, tonnage and distance to be moved.

Hand tramming, as such, presents an easy field for standardization, and hand tramming is necessary to at least some extent in all mines. On the other hand, when the question of a main haulage level in an otherwise hand-tramming mine arises, special equipment is resorted to. If these main haulage levels are through heavy ground, the size of equipment is of great importance. If through solid ground, even though some timber is necessary, then size of equipment depends on tonnage and distance to be moved.

The problem is to establish standards for hand tramming and for motor haulage of a specific character. These should cover a major portion of tramming problems. For the large haulage system devised to fit some particular condition or tonnage, the operator will be inclined to diverge from standards, except possibly as regards bearings, wheels, track, track curvature and switches.

The condition controlling underground haulage in general are as follows:

1. Present equipment.
2. Size of drift, tunnel or crosscut.
3. Tonnage to be moved.
4. Size of material to be moved.
5. Distance to be moved.

Hand Tramming

Track: Weight of rail, 12 or 16 pound; gauge, 18 inches; curvature, 8-foot minimum radius; switches, double movable points; tie spacing, 24 inches; grade, 0.75 percent.

Car wheels: Diameter, 12 inches; bearings, (a) hub type, all loose wheels, (b) center bearing, no loose wheels; tread, 3½ inches wide; flange, 1⅛ inches deep.

Car body: Capacity, 18 to 20 cubic feet; type, box; dump, (a) revolving end dump, (b) straight side dump; length, 4 feet; height, 2 feet; width, 2 feet 6 inches; truck, all steel; coupling, chain or link.

Motor Haulage

Again the question of size of equipment arises, and after hand tramming, I would suggest an intermediate motor haulage type. This one type should cover the majority of cases and could be used for tramming up to 500 tons per day for a distance of one mile. In addition, equipment of this character could be used in the narrow timbered drift or gangway.

Track: Weight, 25 pound; gauge, 18 inches; curvature, 25-foot minimum radius; switch stands, (a) vertical, (b) horizontal, (c) split switch, spring type; tie spacing, 24 inches; grade, 0.5 percent.

Car wheels: Diameter, 12 inches; bearing, roller center or hub; lubrication, light grease; tread, 3¼ inches; flange, 1⅛ inches.

Car body: Type, rocker bottom side dump; capacity, 30 cubic feet; truck, all steel, spring draw bar construction; coupling, pin type preferred.

Motor: Type, (a) storage preferred, (b) trolley; weight, (a) storage, 3½ to 5 tons, (b) trolley, 5 tons; trolley, 7 feet above rail and protected at chutes.

In going beyond the above recommendations, I would not attempt standardization, except that I should maintain the rocker dump car up to capacities of three and four tons, beyond which some other type of car becomes necessary.

* General superintendent, United Verde Copper Company.

INDUSTRIAL STANDARDIZATION DURING 1924

NOTABLE developments in the industrial standardization movement, including important progress in the mechanical and mining industries, and in the safety field, its further extension into managerial and trade association activities both here and in Europe, and steps looking toward it in Latin America have taken place during 1924, according to an announcement of the American Engineering Standards Committee.

Most of the great firms are now coming to have some definite organization for their standardization work, instead of leaving it as a more or less incidental part of their engineering and production activities. Increasing competition is bound to result in some form of definite organization for the work in the majority of all but the smallest companies. This has already taken place in Germany, where more than 1,000 firms have such organizations, some of the larger companies having as many as 100 or even 200 members of their staff devoting full time to such activities. The increase in the number of associations and companies affiliated in the membership of the American Engineering Standards Committee is a notable step in this direction.

This interest on the part of management is shown by the fact that standardization is becoming one of the most important and appreciated activities of trade associations, which are the principal mechanism through which management arrives at collective industrial policies. For example, 150 trade associations are officially participating in the work of the A. E. S. C. through accredited representatives.

In all, about 70 standards have been approved by the American Engineering Standards Committee, and 100 others are under way. Of these, 32 have to do with civil engineering and the building trades; 25 with mechanical engineering; 15 with electrical engineering; 4 with automotive subjects; 11 with transport; 1 with ships and their machinery; 14 with ferrous metals; 15 with nonferrous metals; 12 with chemical subjects; 2 with textiles; 16 with mining; 5 with the wood industry; 1 with the paper and pulp industry; and 11 projects with topics of a miscellaneous or general character.

A particularly important feature has been the development of the work on mining. Until the very recent past little had been done in the mining industry. The pioneer work in this field has been done by the United States Bureau of Mines, which was first in the field, and by the American Mining Congress. Work on no less than 10 mining projects has been started under A. E. S. C. procedure during the last year. These include codes for rock dusting, mine illumination, ventilation, use of explosives in coal mines, and underground transportation.

FUEL PROBLEMS IN THE METALLURGY OF ZINC

A STUDY of fuel problems in the metallurgy of zinc is being conducted by the Interior Department at the Mississippi Valley Experiment Station of the Bureau of Mines, Rolla, Mo. Preliminary visits have been made by the investigators to a number of zinc smelting plants in Kansas, Oklahoma and Arkansas. At these plants, information was obtained concerning methods of operation, fuel problems and refractories problems. A general study of the literature of zinc smelting and high temperature measurements is being made.

NEWS OF THE MINING FIELD

A Resume Of The Activities Of The Mining Industry And Items Of Interest In The Field

Studying Effects Of Drought On California Mining

The Mineral Resources Section of the Commonwealth Club of California is making an intensive study of the effect on California mining of last year's drought. At a recent meeting in San Francisco, W. J. Loring made some interesting remarks on the effect of the lack of water at Plymouth during the summer months. Tailings from the mill of the Plymouth Consolidated were impounded, and the excess water returned until its consistence was such that the metallurgical efficiency of the plant was impaired. For domestic requirements of the town, water was hauled by motor truck for a distance of three and a half miles. During this period the output from the Plymouth mine was reduced by one-half.

While this recent drought was rather unusual for northern and central California, mining organizations are determined to take the steps necessary to place the mining industry in a safe position should there be a recurrence of this situation.

A movement for the construction of restraining dams in various rivers has been under way for some time and is gradually drawing to a head. This would be beneficial to both the miner and the agriculturist.

Northwest Associations Drafting "Blue Sky" Bill

Committees of the Northwest Mining Association, the Spokane Chamber of Commerce and the local section of the A. I. M. M. E. are framing a measure to be presented to the state legislature at Olympia, Wash., for the protection of mining investors. The proposed measure is also designed to prevent the Secretary of State or a commission from passing on the merits of undeveloped mines.

Mining securities are exempt under the present "blue-sky law" of Washington, but their inclusion is being advocated by Secretary of State Hinkle.

Miami Copper Would Establish "Employes Relief Fund"

A plan has been suggested to employes of the Miami Copper Company by officials whereby former employes and their families who are in destitute circumstances may obtain assistance through a proposed relief fund.

The plan suggested is that each employe make a voluntary contribution of 25 cents monthly to the fund. The company has agreed to contribute an amount equal to the employes' contribution.

U. S. Ferro Alloys And Vanadium Corporation Unite

The United States Ferro Alloys Corporation will be merged with the Vanadium Corporation of America, according to A. A. Cory, Jr., president of the latter organization. The plan calls for the taking over of the entire control of the Ferro Alloys Company's affairs, but its corporate organization will be maintained as in the past.

Mr. Cory says the consolidation will affect a considerable saving in overhead expenses, as there will be but a single executive and selling organization. The Vanadium Corporation has not hitherto produced ferro-alloys.

Pennsylvania "School Of Mines And Metallurgy"

The mining school at Pennsylvania State College will be known in the future as "The School of Mines and Metallurgy." This action was taken by the college trustees and was announced by Dean E. A. Holbrook. Dean Holbrook pointed out that for the past six years the school has enrolled as many students in metallurgy as in mining.

Tri-State Branch Of Zinc Institute Elects Officers

The Tri-State Branch of the American Zinc Institute have elected the following officers for the year 1925: George W. Pearson, manager of the Lawyers Mining Company, president; Charles A. Neal, manager of the Tulsa-Quapaw Mining and Investment Company, first vice-president; and N. B. Cobban, manager of the Northeast Railroad, second vice-president.

Richard Jenkins, who has been secretary of the organization since its origin, was reelected to that position.

Mineral Tax Proposed In Kansas

A bill has been introduced in the Kansas Legislature providing for a tax of 2 percent on all minerals produced in the state. State Senator Vendemark is its sponsor, and his theory is that "Oklahoma has one; why shouldn't we?"

Prospecting For Gold In Michigan

Alpena County, Michigan, has recently become the scene of gold-mining activities. Although other attempts at gold mining in that section have been futile, those interested in this proposition seem to be in earnest. Two shafts are being sunk on one lease recently purchased by some Chicago people, and a realty firm of Detroit has taken an option on a farm of 160 acres for $100,000.

Ontario's Gold Production Increases

According to official estimates the gold production of the rPovince of Ontario will reach an approximate value of $25,000,000 for 1924. The 1923 production was $20,082,000, showing an increase of 20 percent for last year. Substantial increases in production by two large mines, the Hollinger and the McIntyre, and an output of $1,350,000 by four mines just opened last year, were mainly responsible for this increase.

Nason, Ill., Seeks Incorporation As City

A petition for the incorporation of the village of Nason, Ill., into a city was filed recently in the Jefferson County court. The town is the home of the new coal mine of the Nason Coal Company, of Chicago.

S. D. Warriner Resigns From Anthracite Conciliation Board

Samuel D. Warriner, president of the Lehigh Coal and Navigation Company, of Philadelphia, has resigned as a member of the Anthracite Conciliation Board, of which he has been a member for several years. His brother, J. B. Warriner, general manager of the Lehigh Company, was elected to succeed him.

The Conciliation Board is the court of last resort for the settlement of disputes over the interpretation of the anthracite wage agreement. Composed of three mining company officials and the presidents of the three anthracite districts of the United Mine Workers, it is called upon each year to adjust many grievances of individual miners and groups of employes.

Controversy Between Labor Unions Subsiding

The dispute between the United Mine Workers and the Brotherhood of Locomotive Engineers over the operation of the latter's coal properties in West Virginia on a nonunion scale, is gradually dying down as President Green, of the American Federation of Labor, takes steps to adjust the matter.

This controversy has been pending since President Warren S. Stone, of the Locomotive Engineers, served notice that the Coal River Collieries, which is one of the properties of his organization, could not afford to pay the wage scales insisted upon by the United Mine Workers. Fiery correspondence on the

subject was exchanged some time ago by Mr. Stone and Mr. John L. Lewis, president of the United Mine Workers of America.

Mr. Green has announced the appointment of a committee of the American Federation of Labor to meet with Mr. Stone. His action follows a resolution adopted by the El Paso convention.

The operation of the Coal River properties on a nonunion basis and the consequent flare-up between the two labor organizations has been the incentive for wide editorial comment, characteristic of which was the statement in *Black Diamond* some months ago, that "it has long been a moot question among students of physics as to what would happen if an irresistible force found its path opposed by an immovable body. A demonstration would seem to be among the possibilities."

United Mine Workers' Secretary

Thomas Kennedy has been made secretary and treasurer of the United Mine Workers to succeed William Green. Mr. Kennedy was formerly president of the Hazleton field of the anthracite regions.

Anthracite Wage Agreement

The present wage agreement between the United Mine Workers of the anthracite field and the operators expires on August 31 of this year. Negotiations for a new contract will probably be under way in a few months, and it is quite likely that the operators will seek a reduction in present rates.

Declare Against Wage Revision

The United Mine Workers of Northern West Virginia have lined themselves up with other local organizations by declaring against any revision of the wage scale prior to its termination on March 31, 1927. Van A. Bittner, leader in the Northern West Virginia district, says that: "The United Mine Workers of America will not meet the coal operators to even consider the question of a wage reduction. This action is final and definite."

Canadians Urge Import Duty On Coal

Coal mining interests of the Dominion are urging an increase in the Canadian import duty on bituminous slack coal and the placing of a duty on anthracite dust and screenings, according to consular advices to the Commerce Department from Canada. It is stated that the present duty on bituminous slack no longer gives sufficient protection.

Would Export Chinese Coal To The Pacific Coast

The Chinese press is advocating the export of Chinese bituminous coal to the Pacific coast. They claim that coal costing $3.25 per ton in China could be carried on American ships as return cargo. Adding a freight charge of $3.25, this coal could be marketed for from $1 to $2 cheaper than the American product, which averages $8 per ton.

The quality of the Chinese coal is said to compare favorably with that used on the coast, and it is estimated that 500,000 tons could be shipped annually.

Coal Division Chief On Tour

Charles P. White, Chief of the Coal Division of the Department of Commerce, is making a tour embracing the coal producing states of Pennsylvania, Ohio, Indiana, Illinois, Kentucky, West Virginia and Virginia. He will call on representatives of the industry and other interested parties en route. His schedule will probably include the cities of Pittsburgh, Cleveland, Chicago, Terre Haute, Indianapolis, Cincinnati, Louisville, Charleston and Richmond.

Rocky Mountain Coal Mining Institute Meeting

The Rocky Mountain Coal Mining Institute will hold its next meeting on February 16, 17 and 18 in Denver.

Contributions listed for presentation include the following: The Development of Underground Work, Preparatory for Mechanical Loading, by D. A. Stout; The Alamo Mine, by E. H. McCleary; Safety Measures With the Colorado Fuel and Iron Company, by R. M. McAllister; Cutter Bits, by John H. Emrick; The New Utah Mining Laws, by D. W. Dyer; Operating a Gassy Mine, by Samuel Tescher; Oil Competition vs. Coal, by Franklin P. Wood.

1925 A. I. M. M. E. Meeting In Salt Lake

At a recent meeting of the Utah section of the American Institute of Mining and Metallurgical Engineers it was announced that Salt Lake City would be the meeting place for the 1925 annual convention of the Institute, to be held during the coming summer.

M. & M. Society Election

Robert M. Catlin, of the New Jersey Zinc Co., has been elected president of the Mining and Metallurgical Society of America. He succeeds T. H. Leggett, with whom he has been associated in work in South America. Sydney H. Hall has been elected vice-president and D. M. Liddell secretary.

American Petroleum Institute Elects Officers

J. E. Pew, of Dallas, Tex., vice-president of the Sun Oil Company, has been elected president of the American Petroleum Institute. He succeeds Thomas A. O'Donnell, of California, who has been president of the Institute since its organization in 1919.

Vice-presidents elected are: Edward W. Clark, Los Angeles, head of the Union Oil Company, and Frank Phillips, Bartlesville, Okla., president of the Phillips Petroleum Company.

Cuyuna Range Mine Reopened

The work of stripping a part of the old Mille Lacs mine, Cuyuna Range, Minnesota, is in progress. Two steam shovels were put on recently. The mine which is now controlled by the Manganiferous Iron Company contains two distinct ore bodies.

The ore body which has been developed by shaft will be mined by the underground method as heretofore, but a deposit lying to the south is covered by comparatively shallow overburden, and will be stripped for open-pit operations.

The Mille Lacs mine, as it was known originally, was the first shipper of manganiferous iron ore from the Cuyuna. It has been rechristened the "Louise" mine.

Southern Pacific Establishes Minerals Service Bureau

Establishment of the "Industrial Minerals Service Bureau," under supervision of its geological department, is announced by the Southern Pacific Railroad Company. Comprehensive data concerning deposits of minerals suitable for commercial purposes is being gathered for use of manufacturers in all parts of the United States and even in foreign countries.

Questionnaires, upon which are listed commercial minerals needed for production purposes, have been sent to manufacturers. Returns from these, giving the needs of factories for minerals, are checked with detailed reports showing the minerals available in various sections of the West.

Samples of minerals obtainable in commercial quantities are tested by the geologists and, where necessary, other investigations are made to accurately determine the situation concerning needed supplies. The bureau is working in close cooperation with chambers of commerce and public officials of states and cities served by the Southern Pacific in order that this phase of industry may be developed to the fullest extent.

Reports from various parts of California, Oregon, Arizona, Nevada and New Mexico state that the bureau already is proving a big factor in developing important industrial activity. The Industrial Minerals Service Bureau comprises a part of the general plan of the Southern Pacific to materially aid in developing western states served by it. The bureau acts as a clearing house through which the needs of both the producer and the manufacturer are met.

ILLINOIS MINING SAFETY CONFERENCE

Meeting Called Under Auspices Of The National Safety Council Presents Interesting Program, With Ten Associations Cooperating

TEN associations and governmental agencies cooperated with the Mining Section of the National Safety Council in a two-day mine safety conference held in the Elks Bldg., Springfield, Ill., January 15-16.

The meeting was held under the joint auspices of the Illinois Department of Mines and Minerals, Illinois Coal Operators' Association, the Coal Operators' Association of fifth and ninth districts of Illinois, the Central Coal Operators' Association, the Illinois Mining Institute, the Joseph A. Holmes Safety Association, the United Mine Workers of America, the U. S. Bureau of Mines and the National Safety Council.

An interesting program was arranged in which miners, safety engineers and inspectors, foremen, bosses, superintendents, managers and other executives participated.

Among the interesting papers presented were:

Safety in Underground Transportation; The True Causes of Mine Accidents; Maintaining Interest in Safety; Accident Statistics in Illinois Mines; Mine Fires and Fire Fighting; Practical Methods of Rock Dusting.

Safety In Underground Transportation At Coal Mines As Pertaining To Locomotives

H. T. Bannister, General Safety Inspector, Madison Coal Corporation, delivered an interesting paper on Safety in Underground Transportation, saying in part:

"Any discussion of the use of locomotives in underground transportation in coal mines, from the standpoint of safety or otherwise, naturally resolves itself into separate consideration of the gathering and main line haulage, each of which presents its own problems.

"For main line haulage there are three (3) types of locomotives which have been used with more or less success—the gasoline, compressed air and electric.

"The gasoline locomotive, while perhaps practicable under certain unusually favorable conditions, is ordinarily so extremely limited in its application on account of its poisonous exhaust and the hazard inseparable from the handling and use of gasoline underground, that we need give it no special consideration.

"The compressed air locomotive is theoretically the perfect haulage machine, from a safety standpoint, for use in extremely gaseous mines. Its initial expense, however, including the auxiliary equipment of compressors, pipe lines, storage tanks, etc., and its inability to handle overloads, together with its lack of operating flexibility, and low mechanical efficiency, imposes such a handicap that its operation in Illinois is practically unknown.

"This leaves us with the various types of trolley locomotives, coupled with the limited use of storage battery locomotives, as practically the only machines to consider for main line haulage in our Illinois mines.

"Considering the matter from the standpoint of safety to the locomotive crew, the following points have all demonstrated their importance in our experience of mine haulage:

"All locomotives should have ample cab room at each end so that the motorman and triprider can each have a secure seat, reasonably safe from injury in case of collision, and in no danger of being thrown off the motor by a sudden bump or jerk. Handholds should also be firmly bolted to the locomotive frame and in easy reach of both the motorman and triprider when seated in their cabs.

The custom, unfortunately, too prevalent everywhere, of the triprider jumping off the moving locomotive and running ahead to throw a switch, should be positively forbidden under penalty of discharge.

"Another habit that has resulted in a number of injuries is the practice of motormen coasting up to a latch or switch point and endeavoring to throw the same with their feet or hands.

"Require electric lights to be placed wherever falls of roof have left high places along the entry, so the locomotive crew can plainly see the edges of the fall.

"Each locomotive should have a headlight sufficient to readily disclose a gob-slide, fall or other obstruction two or three hundred feet ahead.

"The electrical equipment and wiring of the locomotive should be in the best of condition so the danger of shock will be reduced to the minimum.

"Trolley wires, feeder cables and entry circuits in general should be installed as permanently as possible with sufficient clearance to minimize danger of contact with locomotive crew, or men using the travelling way.

"Definite rules should be prepared by the Safety and Electrical Departments which will govern the installation of all circuits, due consideration, of course, being given in the preparation of such rules to the local conditions in each mine.

"When all possible measures have been taken for the safety of the locomotive crews, attention should be as carefully given to elimination of injury to others who must unavoidably use the haulage ways traversed by the locomotives.

"The most effective safety measure in this respect is provision of a separate travelling way entirely for the men, but this unfortunately is seldom possible. Where this cannot be done the provision of safe clearance between the locomotive and the ribs and timbering, together with free and unobstructed refuge places, at the legal distances, is of first importance.

"Signs should be placed at switches and curves, warning of the danger of derailments at such places.

"From the manufacturers' standpoint the following are a few items of safety other than those mentioned above which should be compared by the purchaser when in the market for equipment:

1. Adequate shock absorbing and equalizing features.
2. Safe and workmanlike method of trunk wiring. Most companies are using iron conduit or heavy rubber steam hose specially made up with flexible ends well clamped and bolted to locomotive frame.
3. Strong and well designed gear cases with gearing raised well above the ties so that damage to this part of the equipment will be brought to a minimum.
4. Well designed motor suspension.
5. Controlling equipment should be designed to operate practically sparkless, all contacts or contactors to be of extra heavy design.
6. Floor plates of the cabs should be of ample strength to support all weight which they may be expected to carry, and the plates themselves should be securely bolted, in fact, the extreme should be resorted to, in order to provide a safe and spacious cab."

Rock Dusting

J. E. Jones, Old Ben Coal Corporation, pointed out that:

"The recent nation-wide popularity of rock dusting as a prevention of the propagation of explosions in bituminous coal mines has no parallel in the history of coal mining in the progress of safety. Its suddenness causes one to hesitate and reflect as to whether it is of short life and will lose its popularity or that it will grow as a safety measure and become as

essential as other well established safety standards.

"Experiences are possible that will make for or against rock dusting. It is quite possible for a mine that is rock dusted or rather has the credit of being dusted to have disastrous explosions. Such an occurrence would undoubtedly cause some to doubt the efficiency of rock dusting. It is also possible, though not probable, for a well dusted mine to be so filled with explosive gas as to cause an explosion disaster. That the mine was filled with gas would hardly be believed by those in command. Such an experience is quite remote, however, since a mine requiring rock dust would require careful attention and should such a condition arise the rock dust would have a decided effect upon the lowering of the temperature and lessening the explosion force.

"Where dust is to be transported other than in mine cars it would be well to equip the plant with a dust packing device. When dust is handled loose a large amount is wasted in transportation, unloading and loading. Sacked dust is more economically and efficiently handled in the mine than loose dust.

"It seems to be unanimous that rock dusting of roof and ribs in the mine is of first importance and that the barrier method of protection has been delegated to second place. This is the conclusion reached by the Old Ben Coal Corporation but it is not considered that the use of the barrier system is to be stopped. A combination of the two systems gives a higher degree of safety than the use of one system alone.

"The barrier system can be used to give added safety by installing dust through barricades in air courses where, because of track, the coating system cannot be applied as efficiently as on haulage roads. In old works entrance troughs may be installed. It would be well to install one large concentrated barrier over the haulage to each mine section placing on the air course or air courses, directly opposite, a barricade of dust troughs. The barrier installations serve a double purpose, that of added protection to the coating system of rock dusting and that of rock dust supply at short distances apart throughout the mine being easily available in the event of a mine fire.

The application of rock dust to the roof, ribs and timbers is a mechanical problem depending largely upon the kind of power available for the operation of the dust distributor. Most large mines are electrified throughout, therefore an electric driven high speed fan type of distributor will probably become the most popular. Different mining conditions create different problems to solve. Illinois coal mines, in general, are of such nature that will not permit the application of water on the roof, ribs or floor without serious results. For this reason it is not feasible to wash down the roof and ribs. Our problem is to make the mines safe against propagation of explosions by rock dusting and accepting the conditions as they are. With this in mind our idea of a rock distributor is one that will not only distribute the dust but will also make a thorough mixture of the coal dust and not permitting the rock dust to form a layer on the coal dust."

Accidents At Face

C. E. Anderson, of the Valier Coal Company, gave three things to be considered in prevention of accidents at the face of the mine, which are as follows:

1. Greater care on the part of the miner, enforced by closer supervision
2. Better propping of roof with timber, also forced by closer supervision.
3. The use of a good tool steel pinch bar, approximately five feet long and of sufficient strength to stand all the pressure the miner can put on it.

MINE DUST POISON

Bulletin Of Bureau Of Mines Says Dusts From Lead, Zinc, Mercury And Arsenic Ores Are Poisonous

SOME mine dusts, notably those from lead, mercury, zinc and arsenic ores, are poisonous when they come in contact with the human body, according to Dr. R. R. Sayers, Chief Surgeon of the Bureau of Mines. The more soluable dusts from these ores are the more dangerous. As an example, men are often badly poisoned when mining carbonate or oxide ores of lead, whereas lead poisoning is rare among men mining only galena, or lead sulphide. Another example is the mining and smelting of mercury, where the hazard has long been recognized. When the ore contains free mercury or the more soluble salts, and when the workings are underground and poorly ventilated, some cases of poisoning occur, but the number is far greater among the employes about reduction plants. Poisonous dusts are rarely, if ever, found in coal mines. The preventive treatment in such cases is much more important than the curative treatment.

Some dusts, when breathed, irritate the lungs and produce a disease known by the general name of "pneumoconiosis." This lung disease is called "silicosis" when it is due to breathing rock dust, especially fine silica, "anthracosis," when due to breathing coal dust, and "siderosis" when due to breathing iron dust. Anthracosis is sometimes called coal miners' phthisis or coal miners' asthma. In addition, the breathing of dust sometimes results in or predisposes to bronchitis and other respiratory diseases.

Silicosis is known to be present in a great part of the hard-rock mining districts of the world. In Australia it is found in both the gold miles and the lead-silver mines. It is found in the gold mines of New Zealand and the tin mines of Great Britain in Cornwall, as well as among gold miners of South Africa. It is found in many of the mining districts of the United States, as in Missouri, Oklahoma, Kansas, Nevada, Idaho, Arizona, and California. It has also been found among the granite workers of Vermont.

In order to determine the suitability of different kinds of dust for rock dusting in mines, in addition to chemical and petrographical examination of dust, studies are being conducted on animals at the Pittsburgh experiment station of the Bureau of Mines. Animals are exposed in chambers to a known concentration of dust. The dusts used as basi. types are coal dust, as the type to which men will necessarily be exposed, and quartz dust, as the most dangerous type of dust that might be added for the prevention of explosions. Limestone dust, shale, and kaolin dust are also being tested. From these studies it is found that limestone dust has no more effect than coal dust in the production of fibrous tissue, but the kaolin, or silicate dust, has an effect similar to that caused by quartz dust.

The Bureau of Mines calls attention to the fact that any dust is harmful, if breathed in high concentrations. Coal-miners' phthsis, or miners' asthma, is now comparatively rare and is disappearing due chiefly to good ventilation in coal mines. In some mines coal dust is produced in large quantities by machine undercutting, by blasting, and by loading. Use of water on the cutter-bar, and wetting down the face before blasting and the coal before loading will prevent much of this dust from getting into the air. This lessens the explosion hazard in the mine as well as lessening any possible health hazard.

There is one feature that reduces materially any possible danger from the use of shale. This is the fact that men, with but few exceptions, will be exposed to such dust only for a limited time each day. The Bureau's studies on men suffering from the effects of silicosis in metal mines show that silicosis most frequently occurs among the machine men and the shovelers and muckers. Comparatively few men have been found to be affected among the trackmen, timbermen, or trammers, unless these men have previously worked at machines or shoveling. In the tentative specifica-

tions, prepared by the Bureau, attention is called to the fact that dust from pure limestone, dolomite, gypsum, and anhydrite are preferable. The dust from roof shale free from gritty material is extensively used in Great Britain, but not all roof shales are suitable; often they are too sandy or contain to much combustible matter. So far as the Bureau has been able to find, limestone dust is the safest physiologically for use in rock dusting. Gypsum, or calcium sulphate, also seems to be harmless from a health standpoint.

Copies of Serial 2660 may be obtained from Bureau of Mines, Washington, D. C.

COAL PRICE FACTORS

(*Continued from page* 49)

situation. It seems to be true that no bituminous district, union or non-union, is so poor in friends but what it has an unshakable control over at least 80 or 85 percent of its 1923 tonnage. As indicated, many of the districts have an unshakable control over 90 or 95 percent of their 1923 tonnage. That means that all the switching of business from one field to another that was done was confined, as a maximum, to 20 percent of the 1923 tonnage of the meanest district. Thus, every coal-producing district has as a sort of a back-log from 80 to 90 percent of its 1923 tonnage. Upon this back-log it can rest its production program, its prices, its expenditures, and its capital issues. What each district has to speculate on, therefore, is the tonnage which is in excess of what is here called its back-log tonnage. And it is the struggle to increase the total tonnage by gaining business in extra-lateral territory that has resulted in the amazing price situation.

To illustrate what happens, and for easy figuring, we will say that a certain district had in 1923 an output of 50,000,000 tons. We will say that it still had in 1924 80 percent of that business, or 40,000,000 tons. If it retained four-fifths of its business against the assaults of its strongest enemies it would seem that, so long as it behaved itself, nobody could get that 40,000,000 tons away from it. Therefore, on that 40,000,000 tons it could, if it would, have charged such a reasonable price as would have repaid it for its actual cost of production. That is to say, there was no legitimate reason why the operators of that district should have lost money on that 40,000,000 tons.

The other 10,000,000 tons, however, was involved in a lively controversy. The operators in that field wanted to produce it; they wanted to sell it outside their own "controlled" market. Therefore, they invaded the extra-lateral market, they cut prices to what they thought their competitors doing. At any rate, they cut prices to such an extent that sales realization would no longer return the out-of-pocket cost of production.

It seems to be true that the salesmen, having made a losing price on the 10,000,000 tons, fell into the habit of quoting that price. Therefore, they returned home to name the same figure in what we will call the controlled market. Thus, it was the influence of the price charged in the extra-lateral market upon the home market which caused the loss on the entire business.

We are coming now to the crux of the whole question. It has been shown that the "controlled" market the operators of the fabled district had absolute control of 40,000,000 tons of business. They could, if they would, have charged enough for their coal to have paid them the cost of producing it. And that is what they would have done if, for example, one company alone had been operating in that field. Instead of one company there were a great many companies in that one field. Therefore, it was the competition between the operators in that field for the home or "controlled" business which resulted in the ruinous prices at home as well as abroad.

The considerable point which comes out of this whole analysis of the situation is: The operators in any one district are evidently not competing—daily and hourly, that is, and face to face—with even all of the operators in their same general territory, except in the small market which is common to all of them. In the main, the operators of a district are in competition only with the other operators of that same district. That is, instead of competition being with hundreds and thousands of operators it comes down to being competition between a very few or a few dozen. And it is this intensive competition between the few for business which is "controlled" by those few which has offset the law of supply and demand and nullified the effect of bigger business. It is this neighborhood competition which has brought the industry to the brink of financial ruin at a time when its total tonnage is growing.

And this exposition of the weakness of the bituminous coal industry helps to explain why at times in general business the tonnage is growing at the very moment when the whole of industry is in a period of depression. It is always a depression when an industry is doing a larger business on an unprofitable price basis.

CARBON BLACK INDUSTRY

THE possibility of manufacturing carbon black from oils by an electrical process which possesses advantages over present methods of making this important industrial material by incomplete combustion of natural gas is indicated as the result of experiments conducted by the Pittsburgh experiment station of the Bureau of Mines.

In certain States the decreasing supply of natural gas, and drastic legislation against carbon-black plants, have prevented the expansion that would be economically justified by the increasing use of carbon black in the industries and the gradual rise in price for the better grades of black. At present, Louisiana is the center of carbon-black production in the United States, and the black has to be shipped comparatively long distances to the chief markets, at freight rates that are high because of the bulkiness of the black.

In the course of investigations of the effects of high voltage electrical discharges on hydro-carbons, it was noted that, under certain conditions, natural gas could be decomposed and carbon black produced. The effects of several types of electrical discharge on natural gas and on liquid hydrocarbons and other oils was therefore studied by J. J. Jakosky, associate engineer, in order to ascertain the fundamental factors in the reactions. In the study of natural gas, the possible influence of these factors on the recovery of a larger part of the carbon content of the gas than is now possible was investigated.

In the manufacture of carbon black from oils, by the arc process developed by the Bureau of Mines, the two main essentials are a cheap electric power and cheap light-oil distillates. The process is suitable for noncontinuous or intermittent operation and could, therefore, utilize some of the cheap off-peak power available in practically all parts of the United States and in many foreign countries. Because of the abundance of cheap off-peak power in nearly all large industrial centers, carbon black in many places can be manufactured where it is needed, with a considerable saving in freight rates alone. Especially will this be true as to certain eastern States and as to foreign markets. Prices for second-class power differ considerably with local conditions, but enough off-peak power is available in well-scattered regions of this country at prices ranging from 0.01 cent to 0.05 cent per kilowatt hour. Power in many foreign countries is considerably cheaper.

In connection with the electrical manufacture of carbon black by the Bureau of Mines process, it is probable that the unsaturated gases produced during the decomposition of the oil may constitute profitable by-products if utilized for the manufacture of alcohols. Non-condensable gases formed in connection with the process are suitable for domestic fuel and could probably be sold in those localities where a market exists for domestic gas, thus reducing the total net cost of producing carbon black.

GOLD AND SILVER RELIEF

(*Continued from page 44*)

gested that the present policy of railroads in determining rates on ore shipments should be abandoned or modified. The distinction between high and low grade ore on which rates are fixed on the basis of the risk involved is criticized on the ground that there is no risk. It is suggested that mill concentrates should be in the same class as high grade crude ores because larger expense is required to produce concentrates than to mine crude ores. Concentrates should receive a preferential rate in order to stimulate their production and conserve metal resources. Better alignment of intrastate and interstate rates is recommended in order that small operators who are unable to buy supplies or sell ore in large quantities may ship less than carload lots, which would relieve these shippers of existing rate discriminations.

Freight Rates

It is suggested that the latent metal resources of Colorado and other States be developed by reestablishing transportation facilities which have been abandoned because of a previous large decline in ore tonnage. It is said that development of mine districts has been deterred because they have been deprived of adequate transportation. Railroads should abandon their policy of taking 1 percent of the ore running over the maximum grade as a basis for establishing rates, the policy being attacked as inequitable and equal to a royalty. Railroads are asked to stop nullifying advantageous rates given by smelters through fixing rates which absorb the smelter's advantages. It is said that in many instances fair smelting rates in one section as against those in another were destroyed by railroads, as the freight rates absorbed the advantages offered by the smelters. "Such unfair freight rate manipulation should be investigated and terminated," says Mr. Hamilton.

The report shows that since 1914 freight rates have increased 40 percent from San Francisco and Los Angeles to Kingman, Ariz. Arizona ores valued at $80,000,000 paid $17,000,000 in freight rates in one year.

Power Regulations

According to the report, rulings of State Commissioners in Arizona, California, Colorado, Nevada, and Utah have been detrimental to mining development. In some cases mining companies have transferred their water rights to power companies and received long-period low-rate contracts but they have been abrogated by the commissions and the mining companies required to pay regular rates fixed by these bodies. In some cases mining companies were not able to secure reductions in rates to enable them to continue operations. Mining companies operating hydraulic mines and others using water power have been forced to close because of unfavorable economic conditions. The commission is asked to investigate power rates and regulations in order that the needs of the mining industry may be met. The Federal Power Commission is requested to consider the matter of restoring water rights temporarily abandoned by mining companies because of conditions beyond their control.

Mine Labor

Referring to labor conditions in the mines, the report recommends study of immigration in order that the law may be amended so as to permit the admission of workers from foreign countries where mining is conducted. This would supply the mining industry with a new source of labor. The cost of labor cannot be reduced unless the cost of living drops. Complaint was made as to inefficiency of labor due to short-time employment and scarcity of experienced mine labor. Many skilled miners have left mining permanently, finding higher pay in other industries.

The report says that inflation and changes in price levels are difficulties with which the gold mining industry has had to contend. The commission is asked to study the cause of inflation, the effect of the Federal Reserve Act on price levels, and the possibility of developing an interest rate policy which will stabilize price levels. This study would benefit the mining industry by maintaining more uniform operating conditions.

The report states that the purchasing power of an ounce of silver has declined from 50.6 cents in 1915 to 42.3 cents in 1923, but rose to 44.66 cents in 1924. The purchasing power of the dollar increased from 64.9 cents to 67 cents from 1923 to 1924. From 1915 to 1920 the purchasing power of the dollar dropped from 99 cents to 44.2 cents. In 1921 it increased to 68 cents. Declines in purchasing power result in lower production and increased cost of operation. In the case of gold these increased costs of production operate directly upon profits, as no increase in the price of the metal can occur to compensate for the increased production cost.

Senator Oddie, Republican, Nevada, Chairman of the Commission, says the report will assist it in removing difficulties under which the mining industry is laboring.

Contemporaneous history will record that in the year 1924 the Vandercook mercuric cyanide system for gold and silver extraction was developed and perfected to a commercial unit under successful operation. The place, Toulumne County, California; the sponsors, the California MacVan Company, engineers, Sacramento, Calif. The notable economies are (a) first cost of installation, (b) reduction cost per ton, (c) operation, upkeep and management, (d) higher reclamation of values. The manner of application of mercury with aeration of barren solution (discharge from thickener) forming a mercuric cyanide, greatly hastening extraction, is most simple and astonishingly effective. The method presents a thoroughly scientific combination or idea, a decided refinement of great practical value in modern cyanide practice. The plant mentioned has been inspected by many mining and scientific men during the last half-year whose pronouncements of necessity have been uniformly favorable in view of the results shown. Its virtue, thus heralded, is creating even international interest at this time.

ANNUAL MEETING A. E. S. C.

AT the annual meeting of the American Engineering Standards Committee, Mr. Charles E. Skinner, a representative of the American Institute of Electrical Engineers, was elected chairman for the year 1925, and Mr. Charles Rufus Harte, representative of the American Electric Railway Association, was elected vice-chairman.

The other members of the Executive Committee for the year 1925 are as follows: Ralph G. Barrows, United States War Department; George K. Burgess, United States Department of Commerce; John A. Capp, American Society for Testing Materials; Coker F. Clarkson, Society of Automotive Engineers; W. A. E. Doying, the Panama Canal; Stanley G. Flagg, Jr., American Society of Mechanical Engineers; E. A. Frink, American Railway Association, Engineering Division; C. S. Gillette, United States Navy Department; O. P. Hood, United States Department of the Interior; Sullivan W. Jones, American Institute of Architects; Thomas A. MacDonald, United States Department of Agriculture; Charles A. Mead, American Society of Civil Engineers; A. H. Moore, Electrical Manufacturers' Council; A. Cressy Morrison, Gas Group; Dana Pierce, Fire Protection Group; F. L. Rhodes, Telephone Group; S. G. Rhodes, Electric Light and Power Group; C. F. W. Rys, Association of American Steel Manufacturers; Ethelebert Stewart, United States Department of Labor; George C. Stone, American Institute of Mining Engineers; Albert W. Whitney, Safety Group.

Mr. Albert W. Whitney, the retiring chairman, attended the Pan American Conference on Standardization, at Lima, Peru, early in January.

WEST VIRGINIA'S LABOR PROBLEM

(*Continued from page* 51)

to go back to work. The Raccoon mine is reached from the valley by a man hoist running up about a thousand feet. Ten men are pulled up on a trip by an electric drum hoist. The first trip, in winter, starts before daylight in order to get the men up by work time. On this morning, just as the first trip topped the encline with its miners, all with lighted carbid lamps, a volley of shots was fired from the hillside not a hundred yards away. So unexpected was it that the first one off, an old man of 65, mumbled, "Have your fun, boys; have your fun," thinking that the mule drivers had arrived first by the mountain trail and were exploding pre-Christmas fireworks. He threw up his dinner pail and fell with hardly a struggle. Four other men were wounded with buckshot and pistol balls. The two or three assailants, after discharging their guns into the load of miners, fled up the hillside through the woods.

Again comparing this act with the shootings which happened in the years past, there is food for thought. Then this dastardly murder might have been good for scores of recruits in the ranks of the strikers. As it is, a party was quickly formed of state police and miners, and three arrests were made before the day was over. Fifty automobiles followed the body of the martyr to the right of American labor to work when and where it chooses. Men openly and without fear denounced the deed. The old mountaineer who preached the funeral said that the murderers might be forgiven by God, but he doubted it. Some strikers who seemed to think nothing of breaking a contract said they were not murderers, and asked to go to work. The morning after the funeral the same men who had ridden the first trip the morning of the ambush, with the exception of the dead man and the four in the hospital, were again present for the first trip, and every lamp was lighted. It is true that there was not much likelihood of a second ambush, but every man was determined to show that he could not be forced into the union with hired assassins.

The money of the United Mine Workers is not all spent, and it does not behoove one to make predictions as to what the reactions may be where men are deeply moved, but the net result of this foul attempt to organize by brutal murder seems to be failure. It is not necessary to engage in sweeping recriminations nor to accuse every member of the United Mine Workers of America of murder, but every man, union or non-union, who has ever worked in the once union coal fields of West Virginia has heard the threats for 20 years. The American laborer has been invited into the fraternal orders, urged to join political parties, and exhorted on pain of hell fire to join the church; but the union is the only organization in America which seems to resort to buckshot and blackjacks for a quorum. It does not seem possible that this condition can prevail.

GOVERNORS WILL APPOINT COMMITTEES

ON January 13, Secretary of the Interior Hubert W. Work issued invitations to the Governors of Western States to appoint representatives to serve upon committees that will conduct a survey and reappraisal of Federal reclamation projects and make a report to Congress.

A recent release from the Interior Department states that "in order to facilitate the investigation which was included in the recently enacted reclamation legislation, two committees will conduct the work, one headed by Ex-Governor Thomas E. Campbell of Arizona, and the other by Dr. John A. Widtsoe of Utah. Each project will be taken up separately and the governors are invited to name a representative to serve on the committees while they are appraising the projects in their particular State. Invitations were sent to the governors of the following States: New Mexico, Colorado, Wyoming, Montana, Idaho, Utah, Arizona, California, Nevada, Oregon, Washington, Nebraska, and South Dakota."

Secretary Work's communication to the governors in part follows:

"It is planned to place this work in charge of two committees, each of three members. Ex-Governor Thomas E. Campbell, of Arizona, will be chairman of one committee, and Dr. John A. Widtsoe, of Utah, will be chairman of the other.

"One of the members of each committee will be taken from the permanent staff of the Reclamation Bureau. It is desired to have the State represented in the person of one member and to this end you are asked to designate someone to serve as a member of the committee which deals with projects in your State. Such person should be a broad-minded man of affairs, whose affiliations would not preclude him from making an impartial investigation of conditions with appropriate report and recommendations. The member so to be designated by the governor will assist in the study of conditions on each project within the State, and should be selected with this thought in mind.

"In forming a plan which provides for a representative of the State, the thought which has been uppermost in my mind is to introduce the element of cooperation with the State in the operation of these projects, and in the working out of plans for others in the future. It is believed that this is destined to be an important factor in promoting the success of reclamation and earnest efforts are being made to enlist the interest and assistance of the State in placing reclamation on a solvent and satisfactory basis.

"If the method of conducting the survey outlined has your approval, and I sincerely trust it will, won't you name a suitable person to serve on a committee which will investigate the projects in your State?

"It is expected that the work of the committees will be actively taken up not later than March 1 and you will be notified of the date the committee will begin its survey, as soon as it has been definitely fixed. It is unsafe to predict the time the appointee will have to devote to these duties, but it is not likely to require more than one month."

I. C. C. REAFFIRMS ASSIGNED CAR DECISION

THE Interstate Commerce Commission has reaffirmed its decision abolishing the assigned-car system in times of emergency. The decision is of far-reaching importance inasmuch as it affects not only the railroads but large industrial corporations and public utilities. These companies, now controling their own cars, will be compelled hereafter in times of coal or car shortage to compete with all other users of coal on terms of equality, so far as car distribution is concerned. However, it is regarded as a certainty that the interests affected will carry the case to the Supreme Court of the United States.

CENSUS OF DYES, 1924

THE United States Tariff Commission sent to domestic manufacturers on January 2, 1925, schedules for compiling its annual "Census of Dyes and Other Synthetic Organic Chemicals" for 1924, as for previous years. This will make the eighth annual report compiled by the Commission on the production of dyes and organic chemicals in the United States. This census covers synthetic organic chemicals of non-coal-tar origin, as well as chemicals derived in whole or in part from coal tar (crudes, intermediates, dyes, and other finished coal-tar products). Any firms which manufacture these products and which do not receive schedules for reporting their production and sales of synthetic organic chemicals during 1924 will be sent copies on request. The Commission requests the domestic manufacturers of dyes and synthetic organic chemicals to cooperate by promptly returning these schedules completely filled out, so that the report may be issued early in 1925.

The Hydrotator Company, a newly formed corporation, has acquired the patents and engineering business of L. C. Trent, who has been operating as the L. C. Trent Engineering Company in Philadelphia.

Mr. Trent has retired from the business except for a limited territorial arrangement on the Pacific Coast.

Neither the Hydrotator Company nor its predecessors, the L. C. Trent Engineering Company, is in any way affiliated with the Trent Process Corporation, the Trent Superfuel Company or the Pittsburgh Trent Company which produce so-called "Amalgam" from a mixture of oil and pulverized coal. The Trent patents purchased by the Hydrotator Company cover entirely different processes, one of which deals with the cleaning of coal by Classification and Flotation.

Mr. Walter L. Remick, formerly Engineering Editor of the Keystone Mining Catalogs, will assume active management of the Hydrotator Company after February 1. Mr. Remick is an engineer of wide and varied experience, especially along research lines.

Any problems involving Cyaniding, Leaching, Classification, Desliming, Thickening, Dewatering, Replacing Solutions, Separation and Flotation, Dissolving, Precipitating, Agitating, Filtering, Classification and Separation; in general the treatment of any class of solids mixed with or in suspension in liquids will receive the prompt and careful attention of this organization.

The General Offices of the Company are located at 1328 Chestnut Street, Philadelphia, Pa.

On Christmas Day, 1924, Glenn Grenville Howe, for many years senior vice-president of the Link-Belt Company, passed away at his home in Muskegon, Mich, after a long illness.

His first connection with the Link-Belt organization was as a 16-year-old office boy in 1877. Following his mechanical bent, he drifted into the manufacturing department, and later became the superintendent of the Ewart Manufacturing Company.

When the three related interests, the Ewart Manufacturing Company, the Link-Belt Machinery Company, and the Link-Belt Engineering Company, were merged into one as the Link-Belt Company, in 1906, Mr. Howe became vice-president, in charge of the company's Indianapolis operations.

It was under his direction that the Belmont Malleable Iron Foundry and Ewart assembly plant were built in 1913, and he continued as senior vice-president until failing health led to his retirement from active business.

NEW EQUIPMENT CATALOGS

The **Braun Corporation**, Los Angeles, Calif., has just issued a new Bulletin No. 424 on the Herman Screening Ball Mill. In this bulletin they have attempted to make it something beyond the usual machinery catalog, discussing therein the underlying principles of ball milling. The statements made in the catalog, they claim, are based upon actual operating data, together with properly verified results of authoritative tests. Copy of the bulletin will be gladly mailed upon request to the Braun Corporation.

The plant of the American Manganese Company, at Dunbar, Pa., will be opened in the spring. The company has been reorganized in Philadelphia and will operate under the name of the Dunbar Corporation and will manufacture pig iron products. A deed was filed in the court house at Uniontown showing that the property had been transferred to a group of Philadelphia men. R. M. Marshall is general manager of the plant, which has been closed for more than a year. More than 300 men will be given employment.

The St. Louis branch office of the Link-Belt Company has recently moved from their old quarters at 705 Olive Street to larger and more conveniently located offices at 3638 Olive Street.

Moving to the manufacturing district not only will afford greater freedom of movement but assure a betterment of the heretofore good service.

U. S. Bureau of Mines Photos

Decayed and Broken Timbers on a Mine Dump

Mr. Geo. W. Walters has been appointed District Manager of the North western territory for the Traylor Engineering & Mfg. Company, district office at 815 Alaska Bldg., Seattle, Wash.

Mr. W. H. Agens, formerly district manager of the Traylor Engineering & Mfg. Co.'s Seattle office, has been appointed district manager of the Southwestern territory for the same company, with headquarters at the I. W. Hellman Bldg., Los Angeles, Calif.

LEGISLATIVE REVIEW

(*Continued from page* 81)

Ways and Means. This proposes a constitutional amendment giving Congress the power to collect taxes on income from securities issued under authority of any state.

Miscellaneous

H. R. 11072. Introduced by Mr. Box (Dem., Tex.). Referred to the Committee on Immigration. This bill would apply the quota restriction on immigrants from Canada, Mexico and South America.

H. R. 11279. Introduced by Mr. Perkins (Rep., N. J.). Referred to the Committee on Patents. This proposes to revise the law regarding registration of trade-marks and to provide remedies for their infringement.

H. R. 11258. Introduced by Mr. Perkins (Rep., N. J.). Referred to the Committee on Patents. It proposes to amend and consolidate the copyright laws.

S. 3936. Introduced by Mr. Cummins (Rep., Iowa). Referred to the Committee on Judiciary. It proposes to create a negro industrial commission, which shall study, among other questions, labor questions and means to discourage bolshevism. It appropriates $200,000.

H. R. 11064. Introduced by Mr. Thomas (Dem., Okla.). Referred to the Committee on Public Buildings. It proposes to create a national board of public works of three members, to have charge of the architecture, engineering, construction, and maintenance of all government buildings and works.

THE NATION'S VIEWPOINT

(*Continued from page* 87)

"It is regrettable that the abuses in connection with the employment of children appeared to be so intolerable in a few of the states that Congress was moved to request that authority be granted to the Federal Government to extend its paternalistic arms around all persons in the United States under the age of 18 and promulgate and enforce police regulations that properly belong to the several states."

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Weller Mfg. Co., 1820-56 N. Kostner Ave., Chicago, Ill.

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Morse Chain Co., Ithaca, N. Y.
Weller Mfg. Co., 1820-56 N. Kostner Ave., Chicago, Ill.

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Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Morse Chain Co., Ithaca, N. Y.
Weller Mfg. Co., 1820-56 N. Kostner Ave., Chicago, Ill.

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Morse Chain Co., Ithaca, N. Y.

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Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.

CHAINS, DRIVE
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Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
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Thorne, Neale & Co., Philadelphia, Pa.
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Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
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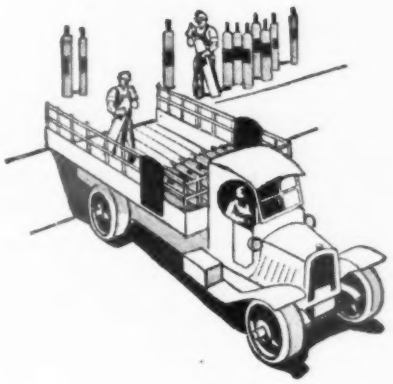
wrote a vice-president of the Linde Company six years ago



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> "This phase of our service can, I am confident, be developed to an extent that, in the course of time it will be recognized by a large percentage of the users of our products as an important factor in the oxy-acetylene field, and will be called upon freely for advice in small as well as large matters."

Time has proved the soundness of this prediction. Thousands of Linde users depend upon Linde Process Service to increase their profits from the use of Linde oxygen. Moreover, the fact that practically all oxygen manufacturers now offer service of this kind indicates that the whole oxygen industry recognizes its value.

Linde Process Service is planned for every Linde user. It reaches out into the shop where but one blowpipe is owned to make its use better and more profitable. It goes to the largest industrial organizations to be of help to every one from the welder's helper to the president.

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Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.

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Weller Mfg. Co., 1820-56 N. Kostner Ave., Chicago, Ill.

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Lidgerwood Mfg. Co., 96 Liberty St., New York City.
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Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
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Weller Mfg. Co., 1820-56 N. Kostner Ave., Chicago, Ill.

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CRUSHERS (Gyratory)
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Ingersoll-Rand Co., 11 Broadway, New York City.
Keystone Churn Drill Co., Beaver Falls, Pa.

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Ingersoll-Rand Co., 11 Broadway, New York City.
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Ingersoll-Rand Co., 11 Broadway, New York City.
Keystone Churn Drill Co., Beaver Falls, Pa.
New York Engineering Co., 2 Rector St., New York City.

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Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.

DRYERS
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Hercules Powder Co., 934 King St., Wilmington, Del.

DYNAMOS
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Goodman Mfg. Co., Forty-eighth Place and Halsted St., Chicago, Ill.

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General Electric Co., Schenectady, N. Y.

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Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
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Weller Mfg. Co., 1820-56 N. Kostner Ave., Chicago, Ill.

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Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Weller Mfg. Co., 1820-56 N. Kostner Ave., Chicago, Ill.

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Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Weller Mfg. Co., 1820-56 N. Kostner Ave., Chicago, Ill.

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Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Ingersoll-Rand Co., 11 Broadway, New York City.

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Hunt, Robert Company, Insurance Exchange, Chicago, Ill.
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FAN DRIVES
Fawcus Machine Co., Pittsburgh, Pa.

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Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

FEEDERS, ORE
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Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Traylor Engineering & Mfg. Co., Allentown, Pa.
Weller Mfg. Co., 1820-56 N. Kostner Ave., Chicago, Ill.

FILTER WIRE CLOTH
Ludlow-Saylor Wire Co., 608 S. Newstead Ave., St. Louis, Mo.

FLOTATION MACHINES
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

FLOTATION OILS
Hercules Powder Co., 934 King St., Wilmington, Del.

FLOW METERS
General Electric Co., Schenectady, N. Y.

FLUX, WELDING
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

FORGINGS
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FURNACES (Copper, Lead, Blast)
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FURNACES (Reverberatory)
Traylor Engineering & Mfg. Co., Allentown, Pa.

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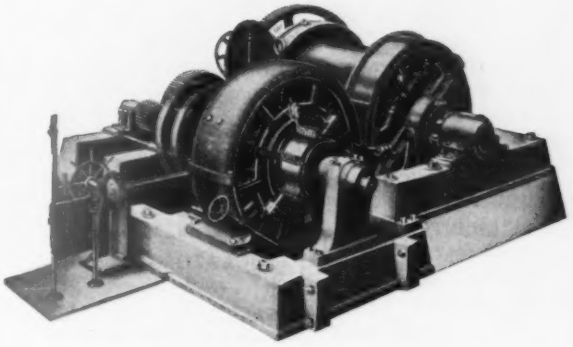
O-B Type M Section Insulator Switches will divide your trolley system into units, any one of which can be disconnected without affecting haulage in other parts of the mine.

O-B Engineers have investigated many properties and perhaps can help you in applying section switches to your trolley system.

The Ohio Brass Co.
MANSFIELD, OHIO

The Connellsville Manufacturing and Mine Supply Company

Connellsville, Pa.



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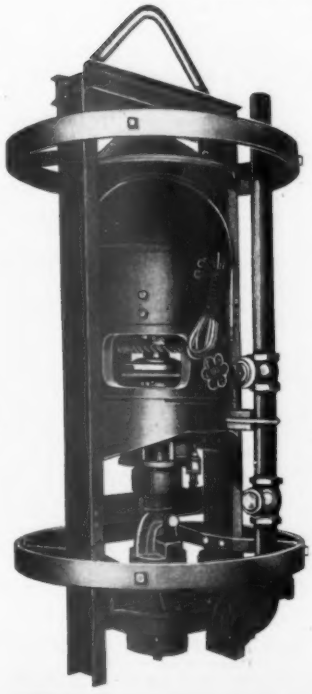

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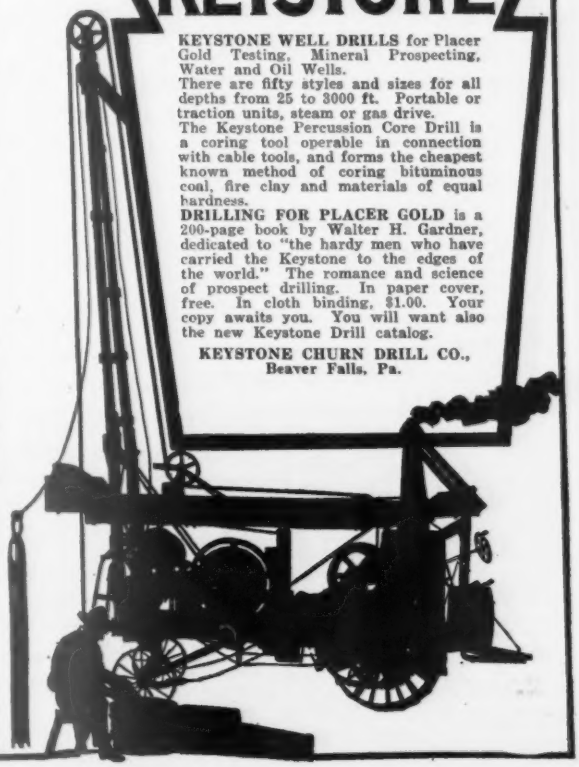

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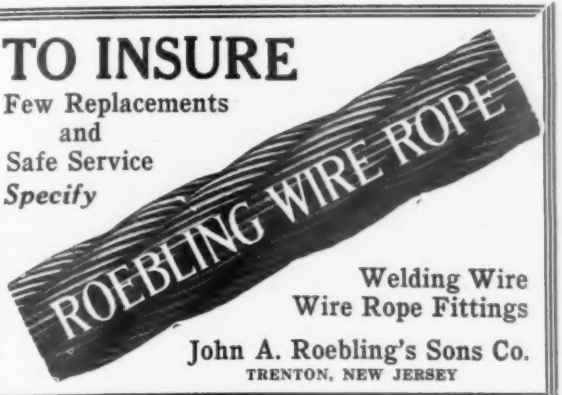

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A Curling Wisp of Smoke

Arizona Mining Journal carries the account of a Mexican employed by a large lead and silver mine, who is known as "Antonio, the Cave Finder." Antonio is an opportunist who has used his wits. The ore in this mine is found in a series of caves, and Antonio's method is to go about smoking cigarettes vigorously and watching the smoke. When this escapes through some hidden break in the rock formation he instructs that work be done in that direction. It is reported that the total length of the caves opened up in this manner is 2,700 feet. Antonio is still watching the smoke! "Watching the smoke" is applicable to more than the discovery of new mines.

The mining business is complex and there are many phases of it and its contacts that must be continually watched. Our Government is ever growing and changing, and improvement sometimes comes only after violent and disastrous growing pains. That all mining men may meet their continually arising national problems, an organization has been developed from within the industry—the American Mining Congress. This organization is equipped to serve you. What is your problem, cheaper operation—taxation?

The smoke of national affairs is being continually watched by

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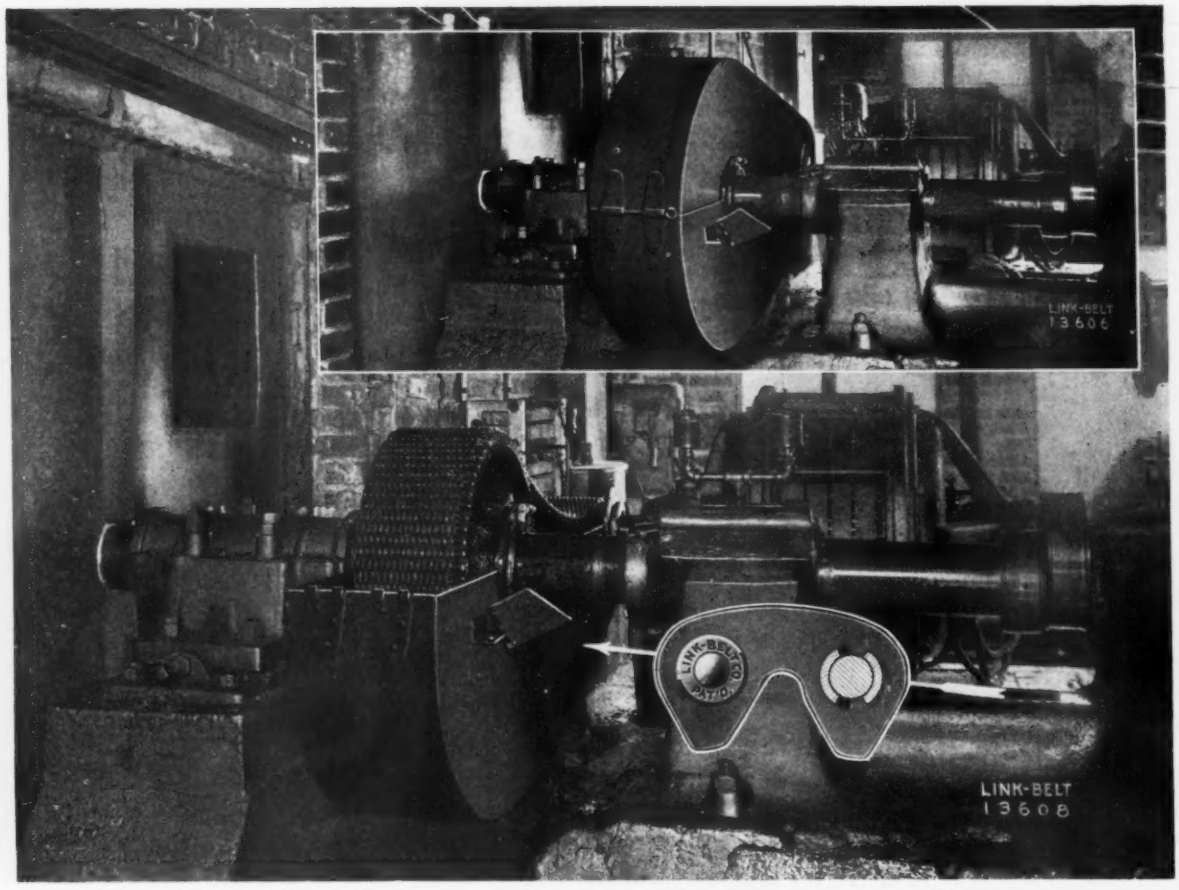

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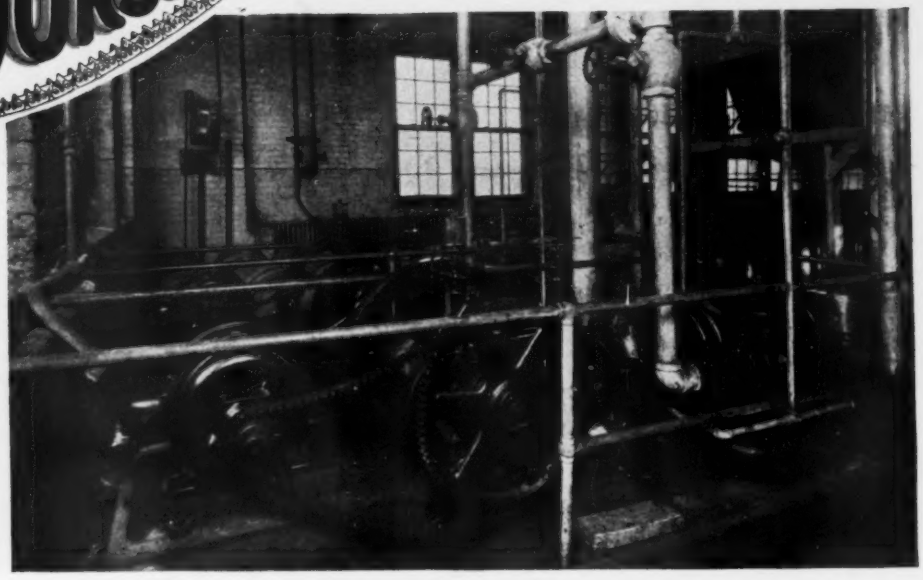

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